Telephony

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INDEPENDENT TELEPHONE MEN

William B. Woodbury

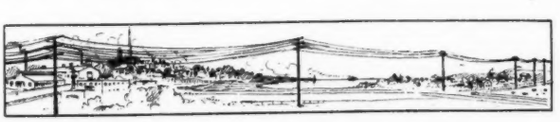
PROMINENT among the men in the operating field of the Independent telephone movement is William B. Woodbury, general manager of the Home Telephone Company, of Detroit, and of the Interstate Long Distance Company of Michigan. Mr. Woodbury was born at Columbus, Ohio, and was graduated at the Ohio State University. For a while he engaged in newspaper work, as a member of the staff of the Ohio State Journal, which led him to take a hand in politics. He was one of the Republican electors in Ohio in 1900 and had the distinction of being the youngest member of the electoral college that cast the ballot for William McKinley. In the drawing of lots for the honor of carrying the result to the successful candidate, Mr. Woodbury was the lucky man, and as he was well acquainted with the martyred president, this was a pleasant duty.

In the early winter of 1900 Mr. Woodbury entered the employ of the Everett-Moore syndicate, of Cleveland, taking the position of general contract agent for the Federal Telephone Company. His signal success in building up the Federal company rapidly earned him promotion to the position of assistant general manager of the Cuyahoga Telephone Company, of Cleveland. In his new position Mr. Woodbury had direct charge of the securing of new business for the Cuyahoga company, and the result of his work was immediately shown by the growth of the company's list of telephone subscribers from less than 7,600 in 1901, to considerably over 23,000 in 1906.

In March, 1904, the Cuyahoga Telephone Company installed a modern common battery system. To provide for this improved service, the rates were revised, the entire contract business of the company was re-written and over 13,000 new subscribers were added before February 15, 1906. The ability for organization and in securing new business attracted the attention of the leading telephone men of the country to Mr. Woodbury, with the result that in the early spring of 1906 he was asked to take charge of a campaign having for its purpose the organization of an Independent telephone system for Detroit and Michigan.

Prior to the time that the Home Telephone Company entered the Detroit field, telephone users had been annoyed by the organization of three telephone companies which lasted only long enough to completely disgust the public with a double service. The situation was, therefore, a difficult one when Mr. Woodbury took hold of the work. Nevertheless, in less than two years after the work was begun, and before the beginning of 1908, the plants of the Home company and the Interstate Long Distance system will be giving service and the organization of the two companies will be completed.

Mr. Woodbury is also present manager of the Electric Construction Company, of St. Louis, Mo.; director, secretary and general manager and treasurer of the Marquette Construction Company, of Michigan; director, secretary, treasurer and general manager of the Peninsular Telephone Company, of Detroit; director, secretary, treasurer and general manager of the Co-Operative Telephone Company, of Detroit; acting treasurer of the Northville Telephone Company, of Northville, Michigan, and a member of the executive and finance committees of the International Telephone Association. He is widely known in Independent telephone circles, is universally liked, and has a brilliant future in his chosen work.



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DETROIT TELEPHONE SYSTEM

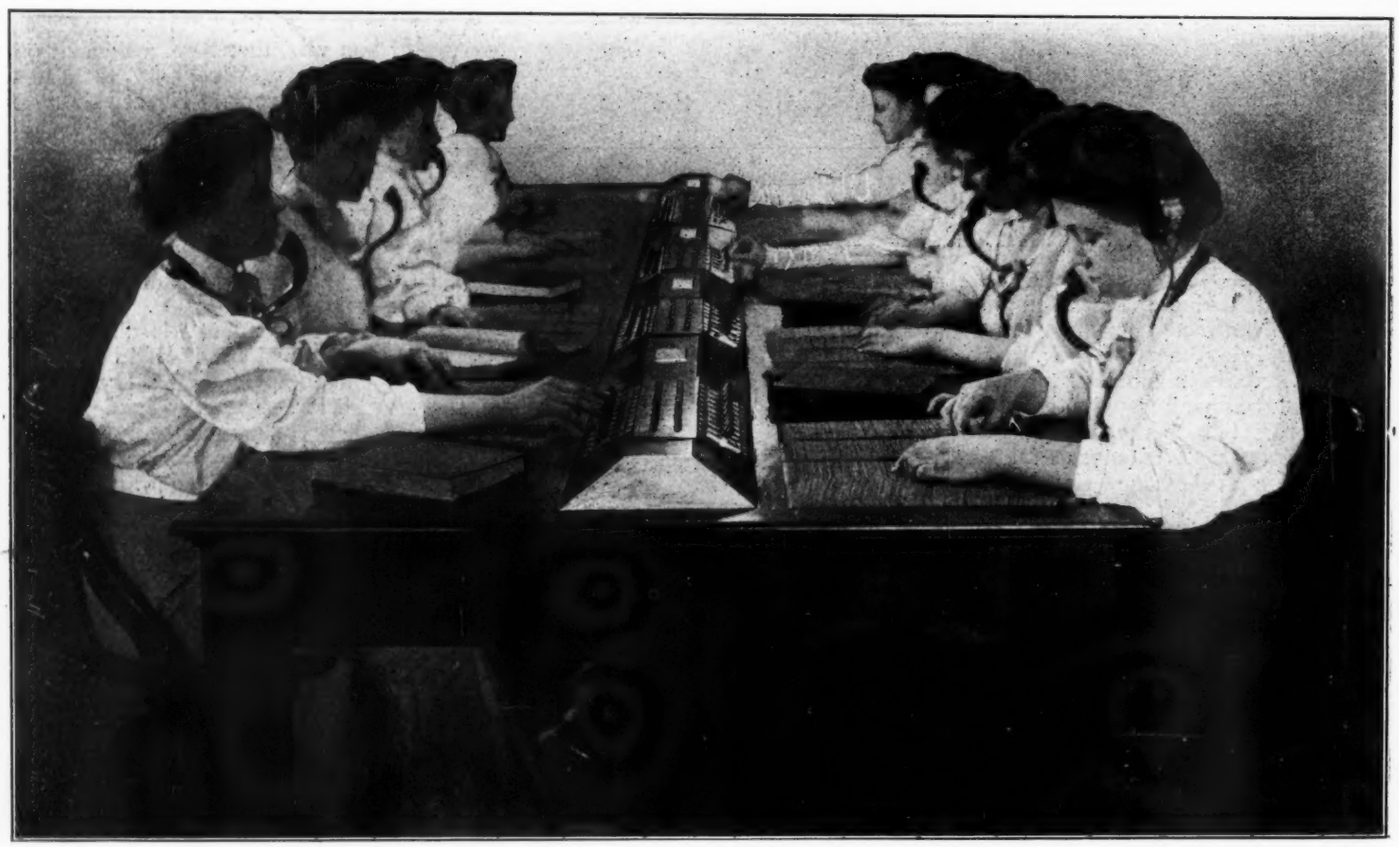
Home Company's New Plant in the Michigau Metropilis Ranks Among the Finest in the United States

By J. P. Boylan

WORK ON the extensive telephone system of the Detroit Home Telephone Company, Detroit, Mich., which will constitute one of the finest in the United States—and that, of course, means the world—is rapidly nearing completion. Experts agree that the Detroit installation is unquestionably the largest initial installation in the history of telephone engineering. No pains or expense have been spared to make the big Independent system at Detroit complete and modern in every detail, and the managers of the company are assured that the people of the Michigan metropolis appreciate and take a genuine pride in the great enterprise.

J. P. Boylan.

The Home Telephone Company has divided Detroit into four districts, served respectively by the City, Oak, Field, and Dell exchanges. Of these, the district of the City exchange, is the most thoroughly built up. It covers an area of approximately nine square miles and embraces within its limits the entire business section of the city and a considerable portion of the more compactly built residence section. This area is relatively large because the engineers realized that the bulk of the business would be carried on within this area, and, to keep the efficiency of the service high, it was necessary to reduce the percentage of trunking required. The Oak exchange serves that portion of the city lying north of the City exchange district and is principally a residence section. Its area is 5.5 square miles. The Field exchange serves the section of the city lying east of the City exchange district. This territory is partly a manufacturing and partly a residence district. The outlying portions are sparsely settled. The area of the district is nine square miles. The Dell exchange serves the section west of the City exchange, including the suburb known as Delway, which lies immediately west of Detroit and has but recently become part of the city. The eastern end of this district is principally a residence district, but along the river front (south) business and manufacturing interests predominate. The extreme northern and western portions of the district are as yet but little more than open country. The area of the district is nine square miles.



Test board, Home Telephone Company of Detroit.

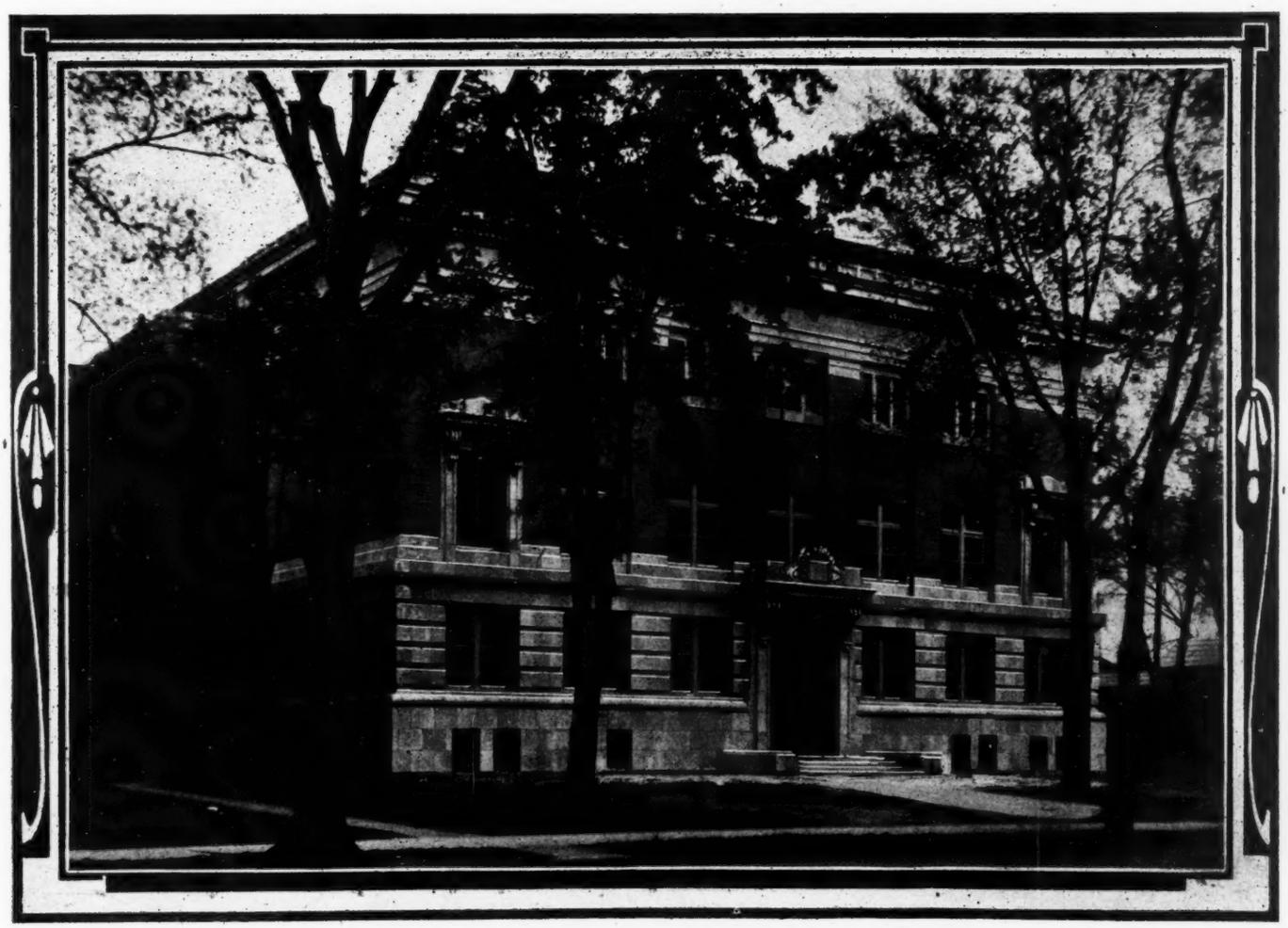
The distribution throughout practically the entire area within the city limits is effected by an extensive subway system covering the entire City exchange district and those

portions of the other exchange districts which are at all built up at present. The subway is of ample size to care for the future needs of the system for an indefinite period. The extent and distribution of the system is best shown by the following statement:

Exchange.	Area Sq. Miles.	Trench Feet.	Duct Feet.
City	9.0	214 300	1 431 300
Oak	5.5	48 250	327 700
Field	9.0	31 400	239 700
Dell	9.0	18 400	160 600
Total	32.5	312 350	2 159 300

The type of construction employed throughout the system made use of multiple duct vitrified tile, covered on all sides by an envelope of Portland cement concrete, three inches in thickness. In a few cases (principally for laterals), single duct tile was used on account of its greater flexibility. The top of the concrete over the ducts is in all cases two feet below the surface of the pavement, and where streets had not been graded the depth below the surface was made such that the subway will be at least two feet below the final grade. The concrete was composed of Portland cement, limestone and sand in the proportions 1:3:6. For some of the work done during this year, a graded, washed gravel mixture was used. This effected some saving of cement, and a considerable saving in the labor of mixing, as no sand was used. The proportions of the various sizes of gravel for the densest mixture were determined by experiment. Tests on this concrete showed it to be equal in strength to that made of limestone.

About 1,100 manholes were built, most of them having sewer connections. They are generally elliptical in shape, averaging about six and one-half feet long, and four feet wide inside, and are from four to twelve feet in depth. They have concrete bottoms, six to twelve inches in thickness, thirteen-inch walls, built of hard burned brick laid in Portland cement mortar, 1:3, and plastered outside with the same kind of mortar. The cast iron frames are supported in I-beams, resting on the brick walls. The frame and cover weigh together about 1,000 pounds. The tops are of plain concrete slabs eight inches in thickness. The concrete, when placed, is supported by sheets of heavy corrugated iron, spanning from I-beam to I-beam, or from I-beam to wall, as occasion requires. The various spans composing the top are bound together by anchors imbedded in the concrete. The corrugated iron has been found less troublesome and expensive than wooden forms, and is just as effective. Laterals are terminated at poles with three-inch wrought iron pipe bends set in concrete and carried up the poles about ten feet.



City Exchange and General Offices, Home Telephone Company of Detroit.

The pipes are each attached to the poles by at least two straps made of 1½x¼-inch iron properly bent, and attached by four ½x3-inch lag screws. Throughout the congested portions of the city, subways occur on alternate streets, so that the aerial cable is confined to the alleys, and few of the aerial runs are more than one block in length. In fact, very little aerial cable crosses streets in any section of the city.

Michigan cedar poles are used throughout, except that some of the 50 and 60-foot poles are of Washington and Idaho cedar. About 10,000 poles have been set, approximately 80 per cent being 35-foot, or under, in length. These

poles have 7-inch tops and were purchased under rigid requirements as to quality of timber, butt measurements and straightness. The poles were inspected at the points of shipment, and none failing to meet the specification requirements in any particular was used in the construction of the plant. All poles are shaved and painted two coats of white lead and linseed oil.

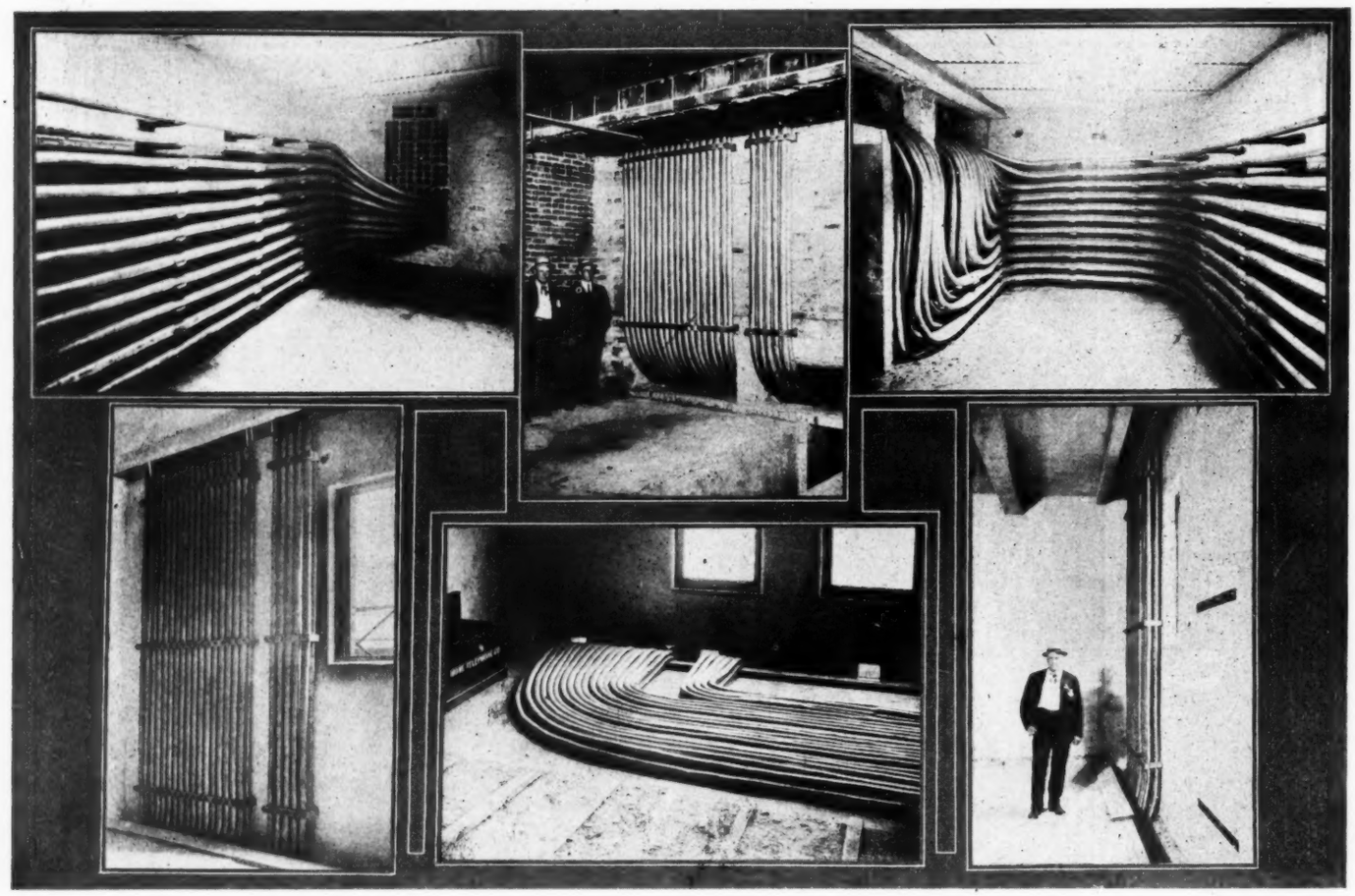
About 500,000 feet of galvanized high strength steel strand, none smaller than 5/16-inch diameter, was used for guys and messenger. This strand was furnished by the John A. Roebling's Sons Company. All hardware employed is of the highest grade material, most of it of special design, and all thoroughly galvanized. Each lot received was subject to rigid inspection and tests. The cross-arms are fir and long leaf yellow pine (principally the latter) averaging more than 75 per cent heart, 3¾x4¾ inches in section and 10 feet long. They were inspected at point of shipment and on arrival at Detroit were allowed to season for several months. Prior to use they are painted two coats of mineral paint. Pins for line arms are made of locust, while for terminal arms, a special steel U-pin, made by the Pierce Specialty Company, from designs by the Home Telephone Company's engineers, is made.

The distribution is practically all cable, about 975,000 feet, equivalent of 100 pair being required in the initial installation. Of this amount 90 per cent is underground. Fifteen per cent of the cable has No. 19 B. & S. gauge conductors and 12 per cent has No. 22 B. & S. gauge conductors, the remainder having conductors of No. 20 B. & S. gauge. The No. 19 conductors are used exclusively for trunks between exchanges, and the No. 22 conductors for short runs in the immediate vicinity of the City exchange.

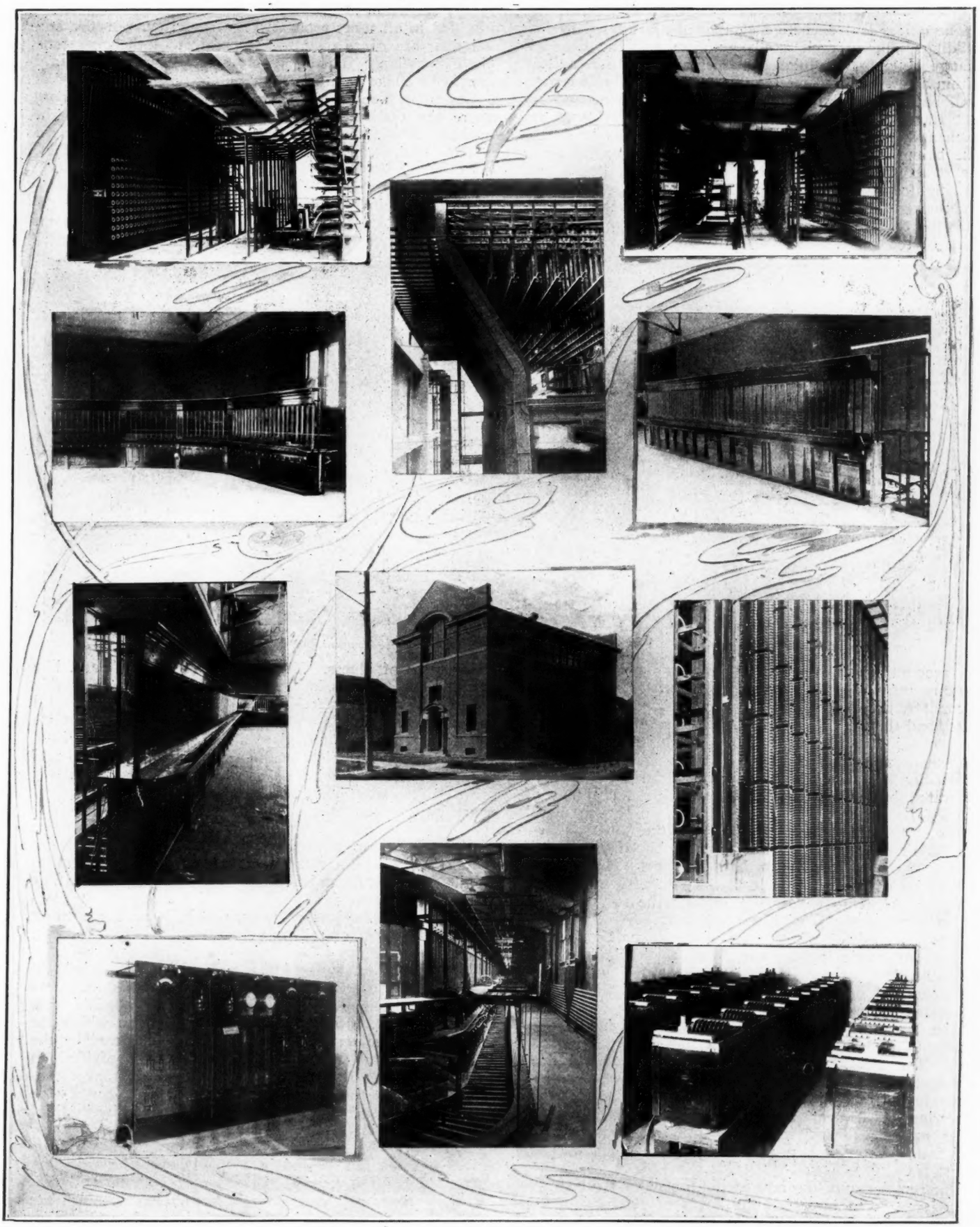
All cable has dry paper insulation. The average capacity required was 0.08 microfarad per mile, one wire being measured against all the rest and the sheath grounded, and all of the cable used showed on test a capacity slightly under this figure. All of the cable sheath is of pure lead alloyed with 3 per cent tin. The cable terminals are of a special type with fuse and carbon protection made by the American Electric Fuse Company, from designs submitted by one of the members of the Home Telephone Company's engineering staff. The cables are tapped at frequent intervals, the pairs being multipled one or more times. The district served by each cable was carefully studied and the distribution of the pairs was made after consideration of the amount of business to be expected.

Most of the taps and aerial cables are large enough to take care of the growth of the plant for a long future period, so that in providing for the extension of the system it will be necessary simply to install additional underground cable of the larger sizes. The largest underground cable is 200 pair and the largest aerial cable is 100 pair. All aerial cable is supported on swisher hangers. The completeness of the cable distribution system is best evinced by the fact that the average length of the subscriber's circuit from the terminal pole to the subscriber's premises, is only about 500 feet. The service wires are of No. 14 B. & S. gauge hard drawn copper, with a weatherproof braid. Where bare copper is necessary, No. 12 B. & S. gauge is used.

The wires are carried on separate glass insulators to the subscriber's premises, no porcelain knobs or cleats being used. In the few instances where it has been necessary to use twisted pairs for service wires, both wires of the pair are rubber covered and doubled braided, and an insulation resistance under the ordinary conditions of immersion, of 250 megohms per mile, is required.



Showing cable construction, Home Telephone Company of Detroit.



Main and interior frames and relay racks.
"A" board city exchange, Sections 13 to 17.
"A" board sections 1 to 15.
Power board.

Cables from main frame to relay rack.
Oak exchange, Field and Dell are similar.
"A" board rear, sections 1 to 14.

Home Telephone Company of Detroit.

Main and intermediate frames and relay rack.
"B" board sections 1 to 17.
Portion of protector side of main frame.
Battery rooms.

The offices and exchange equipment are housed in four buildings, one in each exchange district. The City exchange building, on John R. street and Madison avenue, within a few hundred feet of the heart of the business section, but located on very quiet streets, is about 100x105 feet and three stories in height. The exterior is of red brick and buff terra cotta, simple but massive in design. The basement floor of the building is but four feet below the street and the basement is eleven feet in height, and well lighted by large windows on three sides.

Entering the building through the large vestibule, one finds the room occupied by the contract department on the right of the lobby, and on the left the rooms occupied by the accounting department and auditor's office. Both of these rooms are open to the lobby and separated from it by a counter, the one on the contract department side being plain, and that on the accounting office side being provided with cages for the tellers. The lobby itself, which has been made a decorative feature of the building, is ample in extent and has a very high ceiling with dark panels, richly decorated, but in thorough harmony with the adjoining offices. The floor is Italian mosaic, and a French marble wainscot three feet high runs around the walls and columns. From near the center of the lobby a grand staircase, easy of ascent, rises to the third floor. This staircase is likewise of French marble, but the treads and landings are of interlocking rubber tile, making the steps noiseless and eliminating the possibility of slipping.

Subway construction in down town district, Home Telephone Company of Detroit.

All of the offices on the first floor open on the lobby or connecting corridors. At the front of the buildings, on the same side as the contract department, are the offices of the general manager. On the same side of the building adjoining the contract department is a room for the use of the board of directors. This room is elaborately finished and decorated, both the walls and ceilings being paneled. The wainscot is of paneled mahogany, and fluted mahogany pilasters rise to the plaster frieze above. Directly in the rear of the directors' room is located the engineering department. This is a large, well-lighted and quiet room, receiving its principal light from the north and east. An office is provided for the chief engineer and his staff.

The remainder of the rear of the first floor is given over to a large room in which the heads of the various construction departments will have their offices. There are three toilet rooms on this floor, finished in marble, and provided with the highest grade of porcelain fixtures. Hot and cold water are provided at all wash stands.

Mirrors and plate glass shelves for toilet articles are provided in all toilet rooms. The front rooms on the second floor are given over to the comfort of the operators. There is a large retiring room directly over the general manager's office, having a high ceiling, large windows and a pleasant outlook. Adjoining this is the dining room where the operators will be served with meals or light lunches. A kitchen and pantry, furnished with modern culinary equipment and presided over by a competent chef, will do much for the comfort of the operators.

There is also a locker room of ample size to accommodate lockers sufficient for the needs of more than 200 operators. A full length plate mirror is provided in this room. A small infirmary is provided, fitted for the care of emergency cases of illness. The toilet room on this floor, like all other toilet rooms in the building, is finished in marble and provided with porcelain fixtures. Mirrors are placed over the wash stands and in addition a full length plate mirror is built into one of the walls. The remainder of the second floor is occupied by the long distance terminal and operating rooms, the local terminal room and the battery room. A small toilet room is provided in the terminal room for the use of the wire chief and his assistants. The ceilings of the second floor are fifteen feet in height.

The third floor is used entirely for the City exchange switchboard. The ceiling of this room is thirty feet in height, and the room is lighted by windows on the four sides of the room and by a row of clere-story windows near the ceiling. Four columns, which define the opening for the stairway, are the only obstructions in this floor. A portion of the roof trusses is exposed and this, together with the deep paneling of the ceiling, adds materially in breaking up the echo which is generally present in rooms of this size. On one side of the room, and accessible from the floor below, is a small observation room in which the operation of the exchange is studied and observed by the service department. A small toilet room is provided on this floor. Heat for the building is supplied from a central station, but the piping is so arranged that should it be found advisable to install a boiler this can readily be done at any future time.

The ventilation is accomplished by means of a motor-driven exhaust fan located in a cupola over the operating room. This fan is capable of changing the air in the building three times per hour, and the ventilating openings are so disposed that no noticeable draft is produced. Synchronized clocks are provided in every room and department, these being controlled from a master clock which is situated above the first landing of the grand staircase, in full view from the lobby. The master clock also controls

the clocks on the various sections of the switchboards. A liberal number of telephones is provided in the various offices. These are connected to a branch exchange located in the lobby. Long distance booths are built on one side of the lobby for the accommodation of patrons who desire this service.

A vacuum cleaning system is also provided with taps on every floor so that the cleaning of the building can be easily accomplished and without the dust and annoyance consequent upon ordinary methods of cleaning.

The Oak, Field and Dell exchanges are all alike, and are of the same fireproof construction as is characteristic of the City exchange. They are about 40x60 feet in area and two stories in height, with well lighted and ventilated basements. The basement contains the steam heating apparatus and storage space for fuel and also for construction supplies. On the first floor are located the terminal room, wire chief's room, battery room, and rooms for the convenience and comfort of the operators. The second floor contains the operating room and a small toilet. The operating room is twenty feet in height and is lighted by large windows on four sides. There are no columns or other obstructions in the room. Each of the buildings is provided with its own vacuum cleaning plant. The buildings are not large enough to provide for the ultimate switchboard capacity, but they have been so planned that they can easily be extended to their full size, whenever the growth of the system demands it.

The Dean Electric Company is making rapid progress in the installation of the switchboard in the City exchange building just described. The ultimate number of lines for the City exchange will be 15,000 and for the three branches 7,500 lines each. The present installation for the City exchange will be 8,000 lines and 2,400 for the Oak, 1,300 for the Field and 800 for the Dell exchanges respectively. At the present time all of the twenty-seven A section and seven B sections have been installed, together with answering jacks and cables, key boards, cord relays and position wiring. The work of installing the immense 10,000 line multipule is all that yet remains to be done. The main frame, intermediate frame, relay frame, power apparatus and storage batteries have been installed for some weeks.

As shown in the accompanying illustration of the main frame, the standard protection in use on rack was furnished by the American Electric Fuse Company of Muskegon, Mich. The power apparatus is all of the Holtzer-Cabot Electric Manufacturing Company type, while the two sets of 40-volt storage batteries were furnished by the Electric Storage Battery Company.

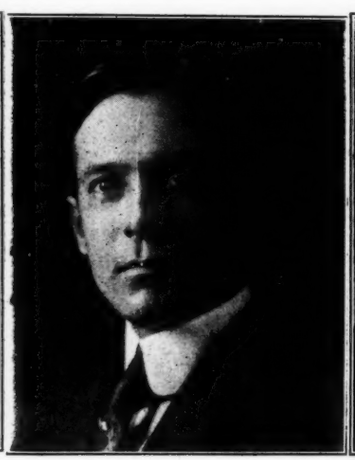
It is believed there will be several features introduced for the first time on the Detroit switchboard, all of which will have an important bearing on rendition of efficient service. Perhaps the most unique feature will be the installation of a four-inch electric clock mounted flush in each A section of the switchboard above the multiple. These clocks are operated by a master clock located in the lobby of the building and connected with the Western Union observatory circuit. This will result in giving out the time more accurately and permit the operator to devote her undivided attention to her key board, as it will not be necessary for her to turn around to look at the clock on the wall. It is asserted that there are more calls from the subscribers in Detroit for the correct time in proportion to the originating calls than in any other city.

In addition to the two signals from each operator's position, which are represented on the monitor's desk, viz.: a white lamp, which operates when any line signal comes in on the position and a red signal which operates when any supervisory signal comes in on the position—a third (green) lamp has been installed which by means of a high resistance relay bridged across the operator's telephone circuit will remain lighted as long as an operator is listening on a subscriber's connection. The monitor, in attempting to regulate one of the most common of operator's faults—listening to subscriber's conversation—is greatly handicapped by not having such a signal described above, as the only way to watch for this irregularity is to switch from one operator listening-in jack to the other, remaining in on each position for a certain interval. It is obvious, therefore, that this acquisition will fill a long-felt want.

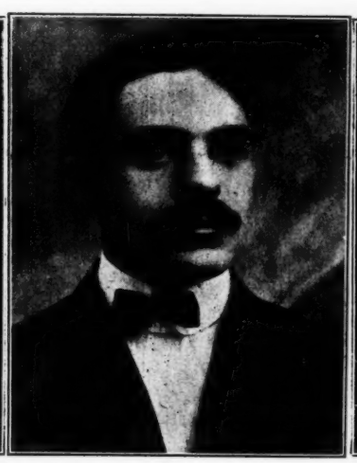
A feature which is expected to promote team work in answering subscriber's calls, especially during the busy hours, without detracting the operator's attention to any extent from her own position, will be the installation of a green pilot signal on each A operator position. These auxiliary pilots are arranged so that a line signal coming in on a certain position will operate the green pilot lamp on the two adjoining positions. If any operator is momentarily disengaged when this green lamp is operating on her position she is expected to look for the line lamp on the adjacent position and answer the call.

It is a well known fact that the best conducted operating room is that where extreme quietude prevails. In addition to the many other features which are employed to bring this condition about is the construction of the operator's ringing and listening keys. Each of the locking four party ringing buttons has a small felt washer glued to a steel washer which is fastened to the shaft of the ringing button so that when a button is released the felt pad, striking the

Charles H. Hood,
General Contract Agent.



B. H. Brooks,
Chief Engineer.



W. W. Grayson,
Auditor.

Joseph Lillich,
Resident Engineer.

under side of key plate, renders the movement noiseless. The operator's ringing key has a retaining spring attached which produces like results.

In order to assist the operator in calling the correct letter on each party line, the surfaces of the ringing keys have the affix letters J. L. R. and X., engraved on each set of four buttons. As a further precaution against false calls, all individual subscribers will be rung on the J button and the party line subscribers will be assigned beginning at the other end, or as follows: X. R. L. and J. Hence, it will be seen that should a subscriber call the first, second or third party on a party line and omit giving the affix letter the operator would ring on the individual button J, and as it represents the fourth party on the line, would, in the majority of cases, not be occupied, so a subscriber would not be subjected to a false call. Another good feature of assigning subscribers in this manner is that it tends to balance the ringing generator load, as the calls will be practically divided between the individual J ringers and the first party line X ringer.

It is the intention to have supervisors answer all calls from complaining subscribers which come in their districts. Accordingly, a supervisor's jack is mounted every four sections on the right hand side of an operator's position. Associated with each of these jacks will be a relay and four large lamps, the opals of which are mounted flush on a blank multiple jack strip at the center position of each section midway between the 8,000 multiple jacks and where the 15,000 multiple jacks will be located. Three multiple jacks will be located in the center of each section in a space provided for outgoing trunks. The center jack will connect with the supervisor's jack of that district; the jack on the left will connect with the supervisor's jack in the adjacent district to the left and the jack on the right will connect with the supervisor's jack in the district to the right. The method of operation is as follows: A subscriber whose signal comes in on the sixth section, for instance, desiring to enter complaint of service is connected by the A operator in the usual manner to the center multiple jack, thereby operating the relay and bringing in the large signals above the multiple on the fifth, sixth, seventh and eighth sections and attracting the attention of the district supervisor, who will plug her telephone set in on the jack located in the sixth section. The four large lamps will go out and the supervisor will be connected with the calling subscriber. This arrangement will also permit the monitor to call any district supervisor or vice-versa. In the event of an A operator finding her district supervisor's line busy, she will connect with either of the adjoining district supervisor's lines.

All conversations from local pay station telephones will be limited to five minutes each. It is a common occurrence, when conversations are not limited, for certain transients to hold a telephone for as high a period as fifteen minutes, and in the meantime others will tire of waiting and either be forced to go to a telephone in another location or use the other company's pay station. In order that a pay station operator will have some means of judging when a conversation has exceeded five minutes a little timer about the size of a Vedder peg count meter has been devised. This article consists simply of a spring enclosed in a nickeled case with a lever mounted on the side near the top, which, by depressing when conversation begins, winds up the spring. The mechanism is so arranged as to require five minutes for the spring to unwind and for the lever to return to its normal position, when the operator would either collect an additional nickel or take down the connection.

A twelve position student's switchboard has been installed at the City exchange, together with four instructors' desks. This board is a fac simile of the City exchange switchboard and is complete in every detail. Prior to the opening of the City exchange a day and evening class was conducted by ten competent teachers and an average of twenty-five students per week were thoroughly trained before being allowed to handle subscribers' calls. This school of instruction was in charge of the writer.

A four position flat top observing board of a sufficient size so that one observer can work at each of the four sides of the desk has been installed in the observing room located on the same floor as the City exchange. A spiral stairway connects the observing room with the floor below, so that no one connected with the day or night operating force will have knowledge of when the operating room is occupied. The observing board is equipped with listening-in lines on the positions of all operators, chief operators, monitors, number clerks and trouble clerk. This enables the management to keep in direct touch with the methods, courtesy and dispatch with which traffic is handled by the different employes. The observing board has a capacity of 120 trunk lines, eighty for observing subscribers' lines and forty for observing trunk lines to and from branch exchanges. The latter feature enables the observer to check the operator assigning the picking up and disconnecting of trunks, which is a very important feature in a thoroughly efficient trunking service. In connection with this board, apparatus also has been installed for observing the uniformity and accuracy of ringing by the operators, the importance of which is apparent, especially in selective party lines. Facilities have also been provided for making service tests with which to test the promptness of operators in answering, supervision and disconnecting on any line entering the exchange; also, to ascertain the operator's accuracy in distinguishing between a busy test and the "out of order" tone test, and to determine whether she pays the proper attention to monitor marks of party line numbers on the multiple. This is accomplished by merely ordering up, by means of an order wire to first position, the subscriber's answering line desired to make test.

A four position wire chief's desk has been provided for the City exchange. All of the improved circuits and other facilities necessary for locating subscriber's trouble have been installed. Located on the surface of the desk between two first positions, so as to be of easy access to the trouble clerk, will be the subscriber's card catalogues arranged numerically. On the upright part of the desk opposite the card file will be 100 "out of order" lines represented by a jack and two lamps, white and red, respectively. Terminating at the end position of the switchboard will be 100 "out of order" plugs and cords.

A permanent signal coming in any hour of the night can immediately be plugged out at end position by the operator in charge. As soon as this plug is inserted in the multiple, an "out of order" tone is put on the line so that any operator testing a line so plugged will recognize the tone and report accordingly to the subscriber. An order wire will be used during the day time, so that any operator can report a permanent signal to the trouble operator located at end position, who inserts "out of order" cord in multiple and reports line and "out of order" cord number to the wire chief by the order wire. When a line showing a permanent signal is plugged with an "out of order" cord, both signals associated with such cord will light on the wire chief's desk. As soon as the line is cleared the upper or red signal will go out. The wire chief is provided with an order wire to trouble operator, by which he orders up test cords and orders down "out of order" cords. The wire chief's subscribers' lines are multipled on the monitor's desk in the operating room so that by operating a switch at the wire chief's desk the calls can be promptly answered by the monitor at night without transferring.

An approved type of ring down relay, devised by the Dean Electric Company, will be used on all the private branch trunk lines, or any other circuit which terminates

on a lamp signal in order that uniformity in calling subscribers can be observed.

Considering the fact that the company expects to increase at the rate of 1,000 telephones per month after the exchanges are cut in service, it is obvious that unusual facilities must be provided to handle calls for new subscribers' numbers. The management of the Home Telephone Company believes that it has solved this problem by designing a ten position cordless information table. It will be seen on referring to the illustration that the raised cabinet work is provided with twenty lines and ten double throw keys per position, all of which are multipled on each of the ten positions. The card record of new subscribers arranged alphabetically is set below the surface of the table. On the right of each operator a space is provided for a current issue of the directory. This table is three by fifteen feet in size, and with the general arrangement as outlined it is expected that extremely rapid service will be given.

The officers of the Home Telephone Company of Detroit are as follows: President, William T. Barbour; first vice-president, Max Koehler; second vice-president, C. Marquard Forster; secretary and treasurer, W. B. Woodbury; chief engineer, B. H. Brooks; auditor, W. W. Grayson.

Mr. Barbour is also president of the Detroit Stove Works, a director of the People's State Bank, of the Security Trust Company, and is also connected with other large Detroit enterprises. Mr. Koehler, of St. Louis, is also vice-president of the St. Louis, Rocky Mountain and Pacific Railway, a director of the Kansas City Home Telephone Company and of the Dean Electric Company. Mr. Forster, the second vice-president, is general manager of the St. Louis Association of Breweries, and chairman of the board of directors of the Missouri-Lincoln Trust Company of St. Louis. Besides the above-named gentlemen the board of directors of the company also includes the following well known men in the business world: Albert N. Edwards, vice-president of the Commonwealth Trust Company of St. Louis; Henry C. Potter, Jr., vice-president of the People's State Bank, and director of the Security Trust Company; Hugo A. Koehler, of St. Louis, treasurer of the Independent Breweries of St. Louis, and a director of other corporations; John M. Dwyer, secretary and treasurer of the Peninsular Stove Company, Detroit, and a director of the People's State Bank and of the Detroit Savings Bank; Elias Michael, of St. Louis, capitalist; A. W. Lambert, treasurer of the Lambert Pharmical Company, treasurer of the Lambert, Dean & Hull Printing Company, and director of the Commonwealth Trust Company; Henry Koehler, Jr., president of the St. Louis, Rocky Mountain & Pacific Railway, and vice-president of the Commonwealth Trust Company; Sam. B. Jeffries, a member of the firm of Harlan, Jeffries & Wagner, of St. Louis, and chairman of the executive committee of the American Breweries Company, and who is interested in other large St. Louis concerns; George E. Lawson, vice-president of the People's State Bank, and a director of the Securities Trust Company; J. J. Goodyear, capitalist; Fred T. Moran, vice-president Michigan Copper & Brass Rolling Mills, director of the People's State Bank, the Security Trust Company and also of the Fire Association of Detroit.

The general specifications of the Home Company plant were prepared by Charles H. Ledlie, of St. Louis, the consulting engineer. Mr. Ledlie is represented in Detroit by Joseph Lillich. The actual construction work has been in charge of W. B. Woodbury, who is assisted by B. H. Brooks, chief engineer of the company.

Subscriber—"Give me 393."
Operator—"What exchange, please?"
Subscriber—"Why, I put the change in the box."

NO TELEPHONE; NO SALE.

The vital necessity of the telephone to modern business transactions is illustrated in a suit recently brought against the New York and New Jersey (Bell) Telephone Company by Louis F. Liotard, of Browertown, N. J. Through his counsel, Henry Marelli, of Paterson, Mr. Liotard claims damages to the extent of $10,000, being in full the price of a piece of property that Liotard claims he might have sold but didn't. Mr. Liotard relates in his plea that for fifteen years he has been a subscriber to the use of the telephone. He found it useful in his business and, in fact, depended upon the telephone to arrange many of his business affairs. Mr. Liotard asserts that in the directory issued by the telephone company for the use of subscribers his name did not appear. It had been omitted through inadvertence.

In fact, from February to May, the date of issue of the last telephone book, the world at large didn't know that Mr. Liotard had a telephone, and he was thereby put to much inconvenience and mental anguish in trying to keep track of his affairs.

It appears that Mr. Liotard has a piece of property which is valued at $10,000. He found a customer in the person of George F. Holden, of New York, and things went along swimmingly until Mr. Holden came to Paterson to look at the property. After some minutes' search through the telephone directory Mr. Holden was unable to find Mr. Liotard's name in the book and he called up the operator and asked whether Mr. Liotard had a telephone. He was told that there was no such telephone.

After spending almost an hour trying to locate Mr. Liotard, Mr. Holden became tired and disgusted and returned to New York and the sale of the property fell through.

BELL COMPANIES COMBINE.

"Close up!" is still the slogan of the Bell. As though it wasn't enough of a "close corporation" already, the telephone trust continues to do the merger act to facilitate its financing schemes.

Announcement is made of the consolidation of the Bell Telephone Company of Philadelphia, the Pennsylvania Telephone Company and the Chesapeake and Potomac Telephone Company, all licensees of the American Bell Telephone Company, operating in southern New Jersey, eastern Pennsylvania, Delaware, Maryland, the District of Columbia, northern Virginia, and West Virginia.

The companies involved operate over 300,000 telephones, but are not competitors, as they do not parallel lines. The purpose of the consolidation is said to be greater economy in administration and operation, and greater facility in financing extensions and enlargements.

The outstanding capital of the Bell Telephone Company of Philadelphia is approximately $25,000,000, that of the Pennsylvania Telephone Company $5,000,000 and of the Chesapeake and Potomac Telephone Company $12,000,000. This will give the new consolidated company a capitalization of $42,000,000 at its inception, as the capital of the Delaware and Atlantic company is only nominal and is owned by the Philadelphia Bell company. This capital of the new company, however, with the approval of the shareholders, will be increased to $60,000,000, the additional $18,000,000 capital being required for improvements and extensions of the merged system. The shareholders at the December meeting will also be asked to approve amendments to the charter and by-laws, providing that the par value of the shares be increased from $50 to $100, and the number of directors be increased from 12 to 15.

The new corporation will constitute one of the most important members of the American Telephone and Telegraph Company, the parent Bell company.

INDEPENDENT TELEPHONE PUBLICITY

Some Pertinent Remarks and Valuable Suggestions from the Head of the International Association

By Theodore Gary

THERE is no publicity department attached at present to the International Independent Telephone Association, but so long as President Theodore Gary has time to wield his fluent pen this absence is not missed much. Mr. Gary has recently written a series of short articles on various phases of the telephone industry, some of which follow:

TELEPHONE SERVICE.

Telephone companies sell nothing but service. The plant is left intact after use from time to time. It is not like a stock of merchandise that is decreased with an active trade. The plant of a good telephone company grows in value with the increase of population and nothing is sold that detracts from the plant. Service is rendered and charged for. All that is necessary is to perform it satisfactorily. One thousand dollars per month income from rentals is about on par with a merchant selling goods sufficient to make that amount in gross profit.

REASONS FOR INDEPENDENT TELEPHONES.

The primary reason for the existence of the Independent telephone movement is, that there was at its inception, and is today, a great unfilled demand for telephone service. The old company with its hundreds of millions of capital was unable to take care of the growth at the time the Independent movement started, and today, after thirty years of development, the combined interests of the Independent and Bell are not able to take care of the pressing demand for telephone service.

As an evidence that this is a true reason of the existence and establishment of this stupendous movement is the fact that mutual companies are springing up in various localities, for the same reason that the Independents were started—an unsupplied demand for telephone service. Wherever there is a community of a few hundred people, there is found a demand for telephone service, generally for the service that will put them in touch with the nearby towns. If these towns are supplied with Independent telephones, then such communities wish service with the Independents, if not, then the Bell. But if they cannot get service and connection with either, then they proceed to supply themselves by forming mutual companies, not for profit, but for local service, and finally get connection with the larger towns in various ways.

COST OF TELEPHONE SERVICE.

From the report of the mayor and aldermen of Amsterdam on the telephone tariff: "Contrary to what one observes with other business, with the telephone, the expenses do not decrease in proportion with the increased number of subscribers, as every new subscriber requires new capital charges, on which interest has to be paid, and on which depreciation has to be written off; and, further, the expenses of the service are not only increased by that amount which is required for attending to the new subscribers, but, also with the additional cost incurred on behalf of the older subscribers. How large this amount will be is difficult to say at present, but this is certain that by an increase in the number of subscribers the number of combinations to be made on the multiple switchboards will increase to such an extent that an increase of the service expenses per subscriber must naturally result."

Edward H. Bouton, president of the Maryland Telephone & Telegraph Company, says: "It has been found that, contrary to almost all other kinds of business, the operating expenses per telephone increase with the number of telephones in service, for that reason, that as the number of telephones increases the amount of use to which each telephone can be put is correspondingly extended, so that the operating expenses per telephone of the Maryland Telephone & Telegraph Company's Baltimore plant are more than twice as much as those owned by the same company in exchanges located in smaller towns. The investment per telephone is also increased, for the reason that greater number of trunk lines between exchanges are needed, and the construction of the switchboards is much more elaborate and expensive. The increased cost of investment means not only additional interest charges, but increased maintenance, an item of very large expense in the telephone business."

From the report of the commission of the Imperial German Post Office: "Furthermore, it must be remembered that the expenses of the telephone system not only absolutely but also relatively increase in proportion to the increasing extension, inasmuch as, especially in the larger towns, the increase in the number of subscribers augments the expense of each single subscriber, on account of the installation of the exchanges becoming even more complicated."

Lord Stanley, postmaster general of Great Britain, speaking of the National Telephone Company's property, says: "The growth of the system has greatly increased its value to subscribers, but the cost of construction and maintenance has increased in even greater proportion, and this must necessarily be the case in every growing exchange system."

Extract taken from the report of the committee on gas, oil and electric light to the city council of Chicago: "The average person does not understand why it costs more per telephone to supply service in a large city than in a small city. The assertion of this principle to many seems a paradox. It is regarded as contrary to the ordinary principle of business—that is, that the unit cost becomes less as the volume of business done, increases. It is but natural to think that the wholesale principle ought to apply in the telephone business as in other lines. This idea prevails because the ordinary individual does not understand the peculiar features of the telephone business, and does not look beyond the telephone on the wall or on the desk. He does not take into consideration that the real business of a telephone company is to furnish service, transmit messages, and not merely to rent instruments. This prevailing idea has been constantly brought home to members of the committee by having their attention called by people thus uninformed to the lower rates existing in other cities; cities between which and Chicago there can be no common basis of comparison. Attention is called to some of the reasons for this exception to that rule of business, so well established.

"Every line added to a telephone system requires the addition of telephone central office equipment to every other line in the exchange, so that the new line may be connected to any one of the existing lines. For every line

added to an exchange, the company must not only handle the additional calls originating from that line, but must provide for the additional calls originating from existing lines to the new line. The average number of calls per telephone increases with the opportunities presented for calling. The size of a switchboard to serve a given number of subscriptions depends upon the number of messages handled and not upon the number of subscribers. It is also true that the number of operators necessary depends upon the number of messages sent and not upon the number of subscribers.

"The greater volume of the business is transacted in a comparatively short period of time. The plant must therefore be constructed, and the operating force provided, to meet the business demands of the high tension hours—to meet the 'peak.' If the increased business of the busy hours could be spread over the full business day it would greatly decrease both the investment necessary and the cost of operation. An enlarged exchange means an enlarged area covered and, therefore, added length to subscribers' lines. This requires a proportionate increase of investment for wires and equipment."

TELEPHONE GROWTH.

It is estimated that there is an investment of more than a thousand million dollars in the telephone business, and quite six million telephones in use. The best authorities say that two hundred millions of dollars of new funds is needed annually for the next few years to take care of the natural growth of the telephone business. This vast sum will be raised by the several Independent companies increasing their stock and bonds, which will be sold to the public.

The telephone business has more than quadrupled since the basic patents expired.

A SAFE INVESTMENT.

It is not generally understood that while the telephone itself is a wonderful invention, the apparatus which had to be provided after the invention of the talking apparatus was quite as difficult and wonderful as the telephone. Before the telephone could be made a commercial success, complicated switches had to be provided.

These switchboards are marvels of engineering skill and workmanship and are very costly. In fact, the investment in a telephone exchange exceeds many times any off-hand estimate, and while the equipments used, including telephones, are extremely expensive, all have reached a point of perfection which admits of but little improvement.

This is evidenced by the fact that practically no changes have been made in the makeup of the modern switchboards and telephones in the past five years. It is this reason, coupled with great and increasing demand for telephone service, that has made Independent telephone securities a desirable and safe investment.

TELEPHONE CONSTRUCTION IMPROVES.

A great change in the methods of constructing telephone plants has taken place since the basic patents expired some ten years ago admitting of competition in manufacturing apparatus and operating telephone exchanges. Formerly the plants were nearly all of open wire—as many as ten cross-arms full of iron wire were strung. This sort of construction was susceptible to a heavy depreciation, not only on account of the rusting of wire and the loss on account of rust and natural decay of the wood, but also danger from sleets and storm.

Under the modern plan a large percentage—about eighty—is brick, motar, coal and copper, the wires placed underground in earthen conduits, in which copper wire is strung, first being insulated and covered with a lead casing. While this form of construction costs much more than the old form, it's done for years to come. No one knows how long, but beyond any life yet known, since the glazed tile will last forever, the copper does not corrode or rust and the lead casing is just as lasting and there are no wearing parts.

Then the present first-class aerial construction is put up without cross-arms or open wire and when open wire is used, not more than two cross-arms are used, most of the wire plant is cable of the same character as that used in underground construction so that the life of this form of construction is largely indestructible. The investments in such properties are gilt edge when they are located in a good locality and rates are renumerative.

LONG DISTANCE LINES.

It is not generally understood that it requires two wires to send a long distance telephone message successfully, and that these wires change position from right to left, and vice versa, at regular intervals, usually one-half mile, while the telegraph uses but one wire to transmit a message. Eight telegrams can be sent over one wire at one time. This accounts for the increased cost per connection of telephoning over telegraphing and also for the greatly increased cost in the construction of the telephone lines. Many of the telephone lines seen through the country cost upwards of $1,000 per mile. The investment required in the telephone business is many times more than the casual observer would estimate it to be. Most of the funds necessary to build lines and telephone exchanges are procured by issuing bonds secured by mortgage on the franchise and property which are sold to the public and are becoming a popular investment.

VALUE OF TELEPHONE PLANTS.

A prominent operator of public utilities asked a banker a few days ago, what made certain securities a ready sale while others were slow sale. The banker replied: "Because those that sell are good and if the others were as good they would find just as ready market."

The operator answered that certainly was not the correct answer, because he said he knew a certain telephone property that has a small issue of bonds amounting to $100,000 that were secured by first mortgage on a telephone plant that had more than $200,000 worth of copper and lead in its cables, figuring the copper and lead at junk value only—since copper and lead are a spot cash material. This double value of absolutely quick selling material, to say nothing of apparatus, real estate, etc., should settle the question of good.

The real facts are simply that the investors of the country are not aware of the real value of the security and that is the reason why one class of security sells at a better rate than others. It had never occurred to this banker that the wrecking value of some telephone plants was sufficient, if sold at junk value, to make a security good for certain of its securities.

PUBLIC UTILITY STOCKS.

It's a gratifying thought that a man with means can employ it so that it will be a benefit to his fellow-men, and at the same time, keep the investment good and secure satisfactory returns. The public utilities offer this field to investors and none of the public service companies has such stupendous demands for increasing facilities as do the telephone companies. It is next to impossible for the combined companies to accommodate the daily increasing demand for telephone service, both local and long distance.

Investments in the securities of good telephone companies serve a double purpose, viz: accommodate others with the convenience and facilities provided by man's in-

genuity, and at the same time provide a good investment in property that is growing daily and enhancing in value.

SOME QUESTIONS ANSWERED.

Here are three common questions:

1st. Why is it necessary to offer any promising stock for general subscription?

2nd. Why do not local capitalists secure the entire issue of a stock which promises large profits?

3rd. Why is a company willing to dispose of any interests in an industry which is earning, or about to earn, large dividends?

These questions are familiar. They seem to be reasonable on their face, and yet, in fact they are extremely unreasonable and illogical. Would you ask your grocer, when he asks you to buy sugar or flour in anticipation of an advance, why he does not hold it himself, and make the profit? Would you ask your coal dealer, when he advises you to lay in your winter supply in summer, because it is cheap, why he does not hold it himself and make the profit? Certainly not, for the good and sufficient reason that neither would be likely to have sufficient capital for the purpose, and if the advice were not acted upon, neither you nor the dealer would be benefited. Industrial stocks are offered to the general public when the individual, or the company, has not sufficient capital with which to operate. It is a common mistake to suppose that the wealthy of any community, even the multi-millionaire, can at any time furnish unlimited capital. Their money is at all times mostly invested, and no matter how good an opportunity may turn up, only a small percentage of them are ready to take advantage of it.

Only sometime ago the British government came to New York city to raise $50,000,000 on a bond issue. These bonds were a good investment, yet the government came here for money. Macon school bonds are gilt edged, yet they are placed in outside money markets. The Pennsylvania railroad is an excellent investment, but only one-fifth of its stock is owned in Pennsylvania. The New York Central & Hudson River railroad securities are stable as government bonds, yet the inventory of the estate of Cornelius Vanderbilt showed that he owned less than one-fifth of its stock.

Standard Oil Company stock is selling at nearly $600 per share on the curb. It is not even a listed security, yet it paid about 40 per cent dividends last year, and John D. Rockefeller owns less than one-third of the stock of the company that he originated.

Stock was sold at the inception of the companies, and the thousands and tens of thousands of investors of these companies, make the greatest share of the profits by becoming purchasers. Nothing of magnitude in local enterprises ever proves a success without the aid of outside capital.

LOUISVILLE HOME CHANGES.

L. G. Parker, general manager of the Central Home Telephone Lines, of Louisville, comprising the Central Home Telephone Company, the Independent Long Distance Telephone and Telegraph Company and the Long Distance Telephone and Telegraph Company, announces the following appointments which took effect October 1:

"M. F. Hosea is appointed superintendent of each of the three companies named and will have supervision over the detail management of the exchanges forming part of their physical property. He also will represent them in their advisory relations with exchange companies, in which they are stockholders, as to the detail managements of such exchanges. A. W. Surrell is appointed traffic manager of the same three companies, and will have charge of the procuring of long distance business, and the handling of it over their long distance lines. He will exercise supervision over the operating in the exchanges forming part of their physical property. He also will represent them in their advisory relations with exchange companies in which they are stockholders, as to the operating in such exchanges. F. O. Warren is made engineer of the three companies, and will have charge of the maintenance of their long distance lines. He will exercise supervision over the central equipment of the exchanges, forming part of their physical property. He also will represent them in their advisory relations with exchange companies in which they are stockholders, as to the central equipment in such exchanges."

A LUCKY "HELLO" GIRL.

The friends of Miss Anna Alhquist, of the Paint Creek (Iowa) Farmers' Telephone Company, contend she is the most popular telephone girl in Iowa, and they have evidence to show for this belief, while at no time wishing to detract from the winning graces of the other thousands

Miss Anna Alhquist.

of operators in the Hawkeye state. The Paint Creek Company is a mutual concern, built, owned and managed by the farmers of Allamakee county and the surrounding territory, which operates 600 telephones in a district east of Waukon to the Mississippi river. Not long ago the members of the company and their families gave a picnic, which was attended by nearly 2,000 people. The service of the company was under discussion, naturally, and the work of Miss Alhquist at Elon, where the central office is located, came in for much appreciation. The suggestion was made that her services be remembered in a more substantial manner, and in a short time a purse of $125 was collected as a gift to her. Representative W. S. Hart made the presentation speech.

Miss Alhquist was almost carried off her feet with surprise, but made a response which showed how deeply she appreciated the compliment. The accompanying portrait, which was furnished by H. A. Hendrickson, of Waterville, secretary and treasurer of the Paint Creek Company, fully corroborates the impression that Miss Alhquist is a hearty, healthy, corn-fed Iowa maiden with a sunny disposition that goes far to help make a courteous and efficient telephone operator.

SELECTION OF EXCHANGE EQUIPMENT

A General Discussion of the Elements Entering into the Construction of a Telephone Exchange

By H. P. Clausen

AFTER THE complete organization of an operating telephone company, one of the first questions which require the manager's attention is the type of the exchange equipment to be adopted for rendering service to the prospective subscribers, and it is for the purpose of placing this problem before the manager in a general and easily understood manner that the writer has prepared the following suggestions upon the subject.

After a decision has been arrived at, either through the efforts of solicitors or the opinions of those who are thoroughly in touch with the situation, the total immediate number of probable subscribers will be placed at a set figure. This will give us a starting point, but equal in importance is the question of immediate capacity of a switchboard which must be considered and the probable ultimate capacity to which the exchange may be expected to grow. While a knowledge of the immediate and probable ultimate capacity of the subscribers' telephones will give information as to the provisions which must be made in the exchange installation, it also gives us a means to determine the necessary capacity of the outside construction work, but as it is not the purpose of this article to discuss line construction, we shall confine ourselves to the central office equipment exclusively.

Before going further, however, it may be well to consider the question of party lines as affecting the capacity of a switchboard. If through a careful canvass of the situation it is found that a large number of subscribers prefer a party line service, this knowledge must be made to serve as available information in the direction of determining the number of line circuits which must terminate in the switchboard. With 1,000 subscribers and with an average of two telephones connected to each line wire, it is obviously a needless expense to have the switchboard arranged for a 1,000-line immediate capacity when only 500 lines will be actually required.

If it is found that the proportion of party lines largely exceeds that of individual circuit lines, then it will affect the design of the switchboard in the direction of determining whether an operator shall be given one hundred lines to take care of per position, or whether it is feasible to install 140, 160, or even more lines per position. These are questions which must receive careful consideration, for it would not be good practice to install 160 lines per operator's position if there is any reasonable certainty that over one-half of the lines terminating at such positions will be provided with two, three, or four party line telephones. An average operator can handle only a certain number of connections per hour, and if the work is carried much beyond the point where the operator ceases to be able to give reasonably prompt attention to the connections, then the service suffers. As a general consideration, however, for switchboards under, say, 3,000-line capacity, it is perfectly safe and may be considered good practice to arrange the positions with space for permitting the ultimate installation of at least 160 incoming line circuits. It is not necessary to install the 160 lines per position, but the space is available and may be used without sacrificing anything in the line of reach of the multiple from an operator's position, for in a 3,000-line exchange and with the answering jacks arranged at least 20 per strip, an ultimate of 160 lines may safely be provided for without placing much of a burden upon the operator through the multiple having been placed an inch or two higher.

This matter of capacity of a switchboard is one which does not always receive the best attention, and the writer's suggestions are to the effect that the answering jack space of a switchboard of the multiple type should be sufficient to handle at least 160 lines. The immediate installation may be anywhere from a few lines up to 160. The average plants operating many party lines and having from 1,000 to 2,000 lines in service find that the operators can handle 120 lines with perfect ease. One hundred and forty lines can be handled with some crowding and 160 lines are being handled in many places, although it is perhaps needless to state that during the busiest portions of the day, it must be a great strain upon an operator to handle 160 lines efficiently.

Now, regarding the ultimate capacity of a switchboard, the writer recalls one instance where the original installation of an exchange was placed at 480 lines with 160 lines per operator's position. The frame work of the switchboard was arranged for permitting the future installation of multiple jacks to the ultimate of 1,200 lines. This was in the summer of 1901. Increase after increase was placed in the exchange, and to-day a new switchboard has been installed having an immediate capacity of over 3,000 lines. There are over 3,600 telephones in the city and the ultimate capacity of the new switchboard has been made 6,000 lines and that in less than six years' time.

From the above it will be observed how difficult it is to state what the ultimate capacity of a switchboard should be, and in order to protect the company against expensive changes before a switchboard is really worn out, it is always wise to allow the ultimate capacity of a switchboard frame work to extend to within reasonable limits. That is, if an exchange has an immediate capacity of 1,000 lines, it will not do any harm to install a switchboard frame work which will permit of an increase to 4,800 lines, as the extension in the dimensions of the switchboard is simply in the direction of height and space for multiple jacks and cables, and it will practically cost less than two or three per cent additional to make such provisions for the future. It should not be understood, however, that when a switchboard is provided having an ultimate capacity for 4,800 lines and an immediate installation, say, of 800 or 1,000 lines, that all other parts of the exchange should likewise be provided with the 4,800-line capacity. This refers particularly to the power provisions and terminal room facilities. It is always possible to increase a power plant without any great difference in the cost, and whether it be done at the time the exchange is originally installed or whether it is done at the time when the additional capacity is actually required, is immaterial.

General experience indicates that if we have an exchange of 1,000 lines immediate capacity, the power plant may safely be arranged for a 3,000-line capacity. It would not be good practice to provide for a much lower capacity, providing it is a newly organized system in which the 1,000 immediate subscribers' lines are required, but if a 1,000-line exchange is installed to replace an existing switchboard, then it would evidently be a waste of money to install a power plant for anything larger than possibly double the capacity of the exchange. Of course, local con-

ditions and circumstances may alter the case, but as a general rule it is safe to assume that in a newly installed exchange the power plant should stand about one to three, as to the immediate and ultimate capacity of the switchboard; whereas, if a simple change of system has been effected, then the ultimate capacity of the power plant may safely be reduced one-third, and in doing so, effect a considerable saving of money.

Before passing to a consideration of equipping an exchange, a few words regarding the power plant may be of value. When a power plant has, for instance, a capacity for 1,000 lines and provisions for permitting an increase to ultimately 3,000 lines, it usually means that the storage batteries have their tanks of sufficient size for permitting additional plates to be installed so as to produce a capacity of battery sufficient for handling the service when the exchange finally reaches the 3,000 subscribers' lines figure, and it would be an inexcusable waste of money to install plates into the storage batteries of sufficient size for taking care of the 3,000-line exchange when only 1,000 lines are installed immediately.

Another point in connection with the immediate and ultimate capacity of a power plant is the charging machinery. An exchange may be laid out to have two battery charging machines installed, and unless the operating company is anxious to take advantage of all safeguards and fancy arrangements, it would be best practice to install a charging machine about large enough to keep the storage battery fully charged when the exchange reaches, say, the 2,000-line capacity, and when the exchange finally passes the point where the single machine cannot handle the service, then install the second machine. This plan, it will be observed, will keep the first expense down somewhat.

We further have the power board. When figuring upon two charging units, the power board must be arranged accordingly. Circuit breakers must be provided for, switches, etc., installed and other provisions made, and if we do not immediately install the second charging machine, we need not install the necessary attachments required for operating the second charging machine; therefore, we have a further reduction in the first cost. Therefore, as a general consideration, when discussing power plants, arrange the plant large enough to take care of the probable ultimate capacity of the exchange. See that your storage battery tanks and bus bars are of sufficient capacity for handling the ultimate capacity of the exchange, and be sure to insist that the wiring between the batteries, the power board and the fuse board is made sufficiently large for the ultimate capacity of the exchange.

With regard to the power board, provide the panels for ultimate necessary charging units, but install only what may be necessary in order to permit rendering service should your exchange go to double the immediate capacity, but make such arrangements which will permit the installation of additional charging panels and charging units should the exchange finally reach its originally expected ultimate capacity.

Regarding the arrangements which must be made in the cross connecting, protector, and other terminal room apparatus, obviously the line side of the protector rack should be made up in the form of simple connecting strips, so that any desired number of incoming line conductors may be taken care of at the least possible expense. The jumper wires, of course, connect to these connectors and from this point connect through to the line side of the protector equipment. In this way it is possible to keep down the expense for protector equipments through installing no more protector arrangements than there may be multiple circuits in the exchange, for were we to install a protector for each cable circuit, the number of protectors in the exchange would become very large and would be quite an item of expense. Of course, certain systems of distribution may call for special requirements in the direction of protector equipments.

As respects the general dimensions of the cross connecting and protector racks, as stated before, the line side of the cross connecting board may be made of large capacity, but the protector and intermediate cross connecting board may be kept down to practically the immediate capacity of the exchange. Space, however, should be provided for permitting an increase in the capacity without requiring the disarranging of the existing installation. That is, in the 3,000 ultimate exchange with 1,000 lines installed, the terminal room apparatus should have at least an immediate ultimate capacity for 2,000 lines, and the adjacent rooms or the shape of the building should be such as to permit the ultimate capacity to be installed at the least possible expense in the direction of taking down partitions, etc.

Now that we have discussed the relations between the immediate and ultimate capacities of the telephone exchange, let us discuss the question of the most suitable type of exchange equipment which may be applied under certain conditions. Upon contemplating the installation of a telephone system, not only must we consider the financial end, but in order to obtain the best results, the technical resources of the operating company must be given careful consideration. That is, if the manager of the telephone company is thoroughly acquainted with the different systems of exchange apparatus, then it is possible for an operating company to profit by such a manager's ability by installing a higher grade of apparatus without involving itself in the necessity for expending considerable money for the higher wages of a more expert class of help. That is to say, an ordinary local battery switchboard without any trunking circuits, or multiple connection or power plants to maintain, can be maintained by the cheapest kind of help, but were one to install a common battery switchboard which necessarily is accompanied by more or less complicated power appliances, then it will be impossible to secure the low priced help and at the same time secure a satisfactory class of service. So, then, upon arriving at the point where it becomes necessary to decide as to what type of switchboard shall be purchased, we must give consideration: First, to the technical talent possessed by the manager or other employes of the company; secondly, to the immediate and ultimate capacity of the exchange. Assuming that the manager and his assistant have only a superficial knowledge of telephone exchange systems and that the exchange has an immediate capacity of less than 400 or 500 lines, then it appears safe to recommend the magneto call type of switchboard, for in such switchboard we are not required to handle anything more complicated than possibly some form of desk trunks, and trunk circuits between the different positions for permitting a transfer of calls originating, say, at position No. 1 and requiring to be completed at a position not within direct reach of the operator before the position No. 1. The magneto or local battery board, therefore, is the simplest type of an exchange equipment which can be installed, and it will take a class of help which we might term as beginners in telephone work, it being possible to handle the exchange on a fairly efficient basis without being required to employ help demanding more than a beginners' wage.

When considering the purchase of a switchboard of the magneto type, we have two kinds of line signals to choose from. One type in which the line jack is mounted separately from the line signal and which requires separate operations for the restoration of the line signal to its normal position and the insertion of the switching plug. Another type consists in so mounting the spring jack in relation to the shutter of the line drop that when an operator places a switching plug into the spring jack, the line drop is restored automatically. It is merely a matter of choice which form shall be adopted.

Now, with regard to the cord circuits, in most boards of the local battery type, it is necessary to provide means for permitting a generator current being projected over either the calling or answering cord and, using a trade expression, the cord circuits will be supplied with two-way ringing and listening keys.

With regard to the line circuits, scarcely any manufacturer offers the common return or single wire switchboard, all switchboards being built upon the metallic plan, which, however, may be connected so as to operate upon the grounded or common return system. The board itself, however, is so arranged that a metallic service may be supplied.

Regarding the supervisory system, in the ordinary magneto switchboard, the cord circuits are provided with clearing-out drops bridged across the cord and in providing for special service the cord circuits may be provided with condensers, repeating coils, specially wound clearing-out drops, etc., to suit the requirements of different service conditions. The application of lamp supervisory system to the magneto switchboard has not yet been adopted to any considerable extent. It can, however, be done and a number of plans are being offered by the different manufacturers of telephone apparatus.

When an exchange consists of more than two positions of switchboards, then some attention must be given to the matter of permitting the completion of a connection between the switchboard positions which are not alongside of each other. In other words, an incoming call is taken care of by one operator and is extended through by means of a trunk circuit to another operator, who may complete the connections in several ways. The first method consists in supplying a number of trunk circuits between the different positions terminating in jacks and drops or lamps at each end, so that with a plug placed into a trunking jack at position A a lamp would be lighted at position C and operator C would place a plug into the jack associated with the lighted lamp and complete the connection with the calling cord circuit. This method of trunking a connection is very suitable for small exchanges where the positions do not extend over three and possibly four. With a larger number of positions it is best to terminate the far end of the trunking circuit in a cord and plug, for then with the A operator plugging into a trunking circuit it will light a lamp associated with the plug on the C operator's position. At the same time the A operator will instruct the C operator with which subscriber's circuit that particular line should be connected. The same way in taking down a connection, the A operator removes the switch plug from the trunking jack and this again lights the lamp associated with the cord upon the far end of the circuit. This method of trunking connections is the one finding most favor in systems which are not quite large enough for a multiple jack service.

The installation of trunk circuits between the different switchboard positions may be adopted up to certain limits, but at certain stages in the size of an exchange it becomes advisable not only from an operating standpoint, but also from the standpoint of initial installation expenses to adopt a multiple jack system. That is to say, all lines entering the exchange will be connected to duplicate jacks in such a manner that any operator in the exchange may reach any of the lines terminating in the exchange. In other words, next to the trunking system, we have the multiple switchboard to consider as a necessary feature of the exchange.

The writer just stated that at certain stages it becomes cheaper to install multiple jacks than to continue the installation of the trunking circuits. This will be better understood when we take for example an exchange with ten positions installed. If we assume that there are two trunk circuits from positions Nos. 1 to 8 of the remaining positions in the switchboard, this would give us sixteen trunk jacks upon position No. 1 and sixteen trunking plugs together with lamps, distributed throughout the eight positions. The same is true of position No. 10. This would give us a total of thirty-two trunk circuits. Now, then, positions Nos. 2 and 9, inclusively, call for the installation of fourteen trunking circuits, or we would have very nearly 150 trunking circuits in a ten-position switchboard, and it would mean the maintenance of that number of cords, jacks, lamp signals, etc., and when the expense for the installation of these trunk circuits is considered, it will be found that the price is but little lower than what the installation of multiple jacks would amount to. This matter of installing multiple jacks also permits of some modification. It is not necessary to install a complete multiple before each operator, for the multiple jacks can be so distributed that each operator will be required to utilize the answering jacks of the lines terminating before her in completing connections. That is, no multiple of an answering jack within her reach need be placed before her so long as she can complete a connection by placing the calling plug into an answering jack. This plan permits quite a saving and has been adopted with considerable success.

It is rare that a magneto call exchange system is installed when an immediate capacity of over 700 or 800 lines is required at the very start. The common battery board is usually given preference, although to a certain extent the centralized calling board finds some favor. In the centralized calling type of boards, it is usual to employ a system in which the supervision is affected through a current flowing through the telephone receiver of the subscriber's station equipment and in this manner operating the supervisory apparatus at the central office, the signal bell at the telephone being provided with a condenser, which prevents the flow of a battery current while the receiver remains upon the hook switch. With this system the line circuits are so arranged that when the receiver is removed from the hook switch, battery current flows through the line signal relay and causes the line lamp to glow. The signal is then obliterated either by series of contacts in the spring jacks or by a system of cut-off relays or impedance coils. It is usual for the smaller sized exchanges to employ the cut-off jack system, and when an exchange is large enough to call for multiple jack circuits, then either the cut-off relay or impedance coil system is adopted, as the series jack contact plan will no longer serve.

TELEPHONE OPERATOR'S HEROISM.

Miss Josephine Conlin, night operator at the Catasauqua (Pa.) exchange of the Consolidated Telephone Company, proved herself a heroine during a fire that broke out in the exchange at 4 o'clock the morning of October 4. The other night operator was sick and Miss Conlin was doing double duty. For company and protection her 10-year-old brother spent the night in the exchange with her. Suddenly the telephone girl detected smoke. When she opened the door to the stairway she was met with a blinding cloud of smoke and followed instantly by a rush of flames. To have gone down the stairway would have been certain death. Miss Conlin did not for an instant lose her head.

In smoke that nearly choked her she telephoned to the town hall for the firemen. She then opened the second-story window, and, letting her brother hang down as far as she could reach, let him drop. She then climbed out of the window, and, hanging by the ledge, also dropped to the street. Both landed safely on the sidewalk, eighteen feet below.

The exchange building, which had just been enlarged, was damaged to the extent of $2,000.

It is estimated that 1,800 Independent telephone companies were organized in the United States last year, with capital stock aggregating $115,000,000.

CONCERNING THE KELLOGG

Important Recent Developments in the Telephone Field Furnish Additional Evidence that TELEPHONY *is Right.*

THE DEVELOPMENTS of the last month furnish new and more convincing evidence that TELEPHONY'S position with regard to the Kellogg Switchboard & Supply Company's relation toward the Independent telephone industry is unassailable. The plank in TELEPHONY'S platform, that as the Kellogg Company, is a Bell-controlled concern, it has no claims on Independents and should be shunned by them, has been ratified in more ways than one. A direct consequence of TELEPHONY'S policy and campaign is that certain other telephone journals have reluctantly ceased to print Kellogg advertising. Of course, this was not done willingly, but the result is the same, and TELEPHONY is glad to have been the means of inducing them to stop giving publicity to the enemy. It may not be pure, unadulterated patriotism, but next to doing right from principle is doing right through fear of the consequences. Laws do not prevent men from wanting to commit burglary, but they usually deter them from doing it. It is results that count after all and, no matter what their motives may be, TELEPHONY is glad that its contemporaries have decided to manifest enough loyalty to the cause they assume to represent by barring Bell advertising from their columns.

This outcome of TELEPHONY'S anti-Kellogg fight came at a most opportune time, for the Western Electric Company, the avowed Bell manufacturing ally, has decided to seek Independent telephone business. This became known when the Western Electric Company sent out a circular, dated September 28, to all Independent companies, soliciting their patronage. President Vail, of the parent Bell Company, issued an official statement announcing this change of policy. Of course, the Bell had to have an explanation for thus radically overturning all its precedents and going after business in the Independent field that it hitherto had refused to even recognize. Mr. Vail says it was for the purpose of placing Bell apparatus all over the country. The real reason, needless to say, is that the Western Electric Company and the Bell yearn to acquire a share of the great Independent patronage—which is increasing daily—and therefore adopt an open door policy.

If the Kellogg Company is to be barred from the Independent field, of course the Western Electric Company should be also, as it has never denied being a Bell adjunct. For that frankness the Western Electric Company is entitled to more consideration, perhaps, for, unlike the Kellogg, it has never made hypocritical claims that it was not controlled by the Bell octopus. The impression prevails that the Kellogg concern is not very well pleased because the Western Electric Company is after Independent business, for the two are likely to tread on each other's toes.

It may be said in passing that TELEPHONY has declined the advertisements of the Western Electric Company as it has those of the Kellogg concern, and for the same reason. Both, at this writing, are Bell concerns and have no place in the Independent field. The Western Electric Company, an avowed Bell concern, is as much entitled to Independent support as is the Kellogg, even if the latter is sailing under false colors—and that, of course, means none at all. This is TELEPHONY'S firm belief, and is the reason why it holds fast to its well known position.

That this position is upheld by Independent telephone men is proved by the following letters selected from many received during the past few weeks:

Leavenworth, Kansas, Oct. 16, 1907.

EDITOR TELEPHONY: Kindly enter my name upon your subscription list with indelible ink. I wish to offer a humble apology for ever permitting my subscription to become delinquent.

In way of explanation it might be well for me to state I dropped my subscription to your paper a couple of years ago, thinking your paper was composed of entirely too many advertisements.

However, my opinion has recently been changed, and was prompted by picking up a copy of your September issue.

I started to read this copy and did not desist until I had absorbed the entire contents including the advertisements.

Conscientiously I am free to state I was then and there convinced that the integrity of your paper to the Independent interests was undisputed. Your absolute refusal to accept the advertisement of the Kellogg Switchboard and Supply Company won my hearty approbation.

I cannot help but wonder if the short-sighted Independent trade journals who print the Kellogg Switchboard and Supply Company's advertisements will not accept the display advertisements of the American Bell Telephone Company's own letters patent, etc., etc., etc., 125 Milk street, Boston, Mass.

Or possibly the Western Electric Company's special bargain day advertisements, calling their dear farmer friends' attention to their special low price of the celebrated White solid back transmitter, sold in lots of one-third dozen at forty-nine cents each, and a section of switchboard thrown in.

Absurd as this statement may seem, it is not by any means an improbability. The time has arrived when the autocratic monopoly is peddling its junk.

Not sublicensee solicitation, but offering for sale outright the White transmitter, receivers, complete telephones and switchboards.

The Western Electric Company may dispose of some apparatus to farmers, as no Independent company would break faith with their Independent brothers by purchasing from the Western Electric Company.

I trust the editor of TELEPHONY will see fit to write upon this subject in every issue as even the farmer can be made to see the light of day by the proper use of printers' ink.

J. FRED MALTHANER,
Constructing Engineer People's Home Telephone Company, Leavenworth, Kan.

Here is one from the Keystone state:

Belleville, Pa., Oct. 2, 1907.

EDITOR TELEPHONY: In regard to the Kellogg company I wish to say that I had quotations from them and the Vote-Berger company for a 50 line switchboard and was undecided which proposition to accept until I became a subscriber for "TELEPHONY" and learned that the Kellogg was a Bell concern. I made up my mind at once not to purchase anything from them as long as the Bell has control of their plant. I don't have any time for the Bell company nor do I care if you wish to use my signature.

Very truly yours,
FARMERS' TELEPHONE COMPANY,
Per B. Harry Smuecker.

P. S.—I wish to thank "TELEPHONY" for the article in the April number, "The Kellogg Again."

From the La Crosse Telephone Company, of La Crosse, Wis., TELEPHONY has received a copy of the Western Electric Company circular, indicating how thoroughly the Bell manufacturing ally is scouring the Independent field for business.

Dr. J. F. Demers, president of the Canadian Independent Telephone Association, writes a strong letter in which he says:

Quebec, Can., Oct. 4, 1907.

EDITOR TELEPHONY: I am in receipt of an article appearing in the September issue of TELEPHONY, entitled, "The Kellogg Company," for which please accept my thanks.

As president of the Canadian Independent Telephone Association, I feel that it is due the members of the association, and your many readers, to define my position on this question. It is with no little satisfaction I hereby put myself on record in answering the questions contained therein.

I have been a user of Kellogg apparatus to a considerable extent in the past, and do not hesitate to say that I have found no inherent weakness in their telephones or switchboards, and that I have been

altogether satisfied with their efficiency. In justice to myself and company I desire to say that I have brought this matter up with Kellogg representatives in the past, and have been given to understand that it was not their wish to be, in ever so small a degree, connected with the enemy, the Bell company, but they had been made victims of the treachery of a trusted member of the Kellogg company, who had been given in trust power of attorney to act in their president's stead during his absence on sick leave. However, that they had made application through the courts to compel the return of the Kellogg stock fraudulently secured by the Bell company, and as soon as this could be accomplished, they would again be free to hold their heads erect once more as true and loyal telephone manufacturers.

Inasmuch as those members of the Kellogg company who are trying to be loyal Independents have failed in their attempt to wrest themselves free from the Bell octopus, they now find themselves in the deplorable situation of the "good dog Tray," namely, the innocent suffering with the guilty.

I heartily endorse the resolution adopted by the International Association at the annual convention held in Chicago on June 27th last, defining the proper attitude of all loyal Independents toward the Kellogg company, so long as their affairs remain in statu quo.

I adopt your motto, "Independent Field for Independents" and most heartily concur in all you say anent TELEPHONY's position.

I AM WITH YOU.

I have the honor to subscribe myself,

Very sincerely yours,

J. F. DEMERS, M. D.,

President Canadian Independent Telephone Association.

The following letter is from an Independent who gives his full name, but requests that only his initials be appended:

New York, N. Y., Oct. 5, 1907.

EDITOR TELEPHONY: Since I am interested in Independent securities, I beg leave to add my word to what has been said in your columns, concerning the purchase of Kellogg equipment by Independent operators and the sale of advertising space, in so-called Independent trade journals, to that company. I cannot see how the buyers are able to justify their action and it is still more difficult for me to understand how such publishers are able to hold up their heads among bona-fide Independent manufacturers, after printing the copy of an out-and-out trust plant.

Much of the success of the old Bell organization lay in the absolute control exercised by the large holding corporation over the smaller operating companies, and while Independents are not bound by corporate ties, a bond of self preservation should hold them close enough together to prevent the inexperienced from making mistakes bitterly regretted by their larger associates.

Let us suppose that an Independent operator, calling for estimates on a certain job, finds that the Kellogg bid is the lowest. Does this purchaser stop to consider that the Kellogg salesman is instructed to sell, even at a loss, to prevent the contract going to a legitimate Independent producer? Does he know that the Bell could afford to run the Kellogg plant at a loss to prevent bona-fide manufacturers from making sufficient margins to enable them to properly develop Independent equipment? Does he realize that in patronizing the Kellogg company, he furnishes funds to better the apparatus used by his competitors in the operating field? Should he be "penny wise and pound foolish?"

"TELEPHONY" is to be congratulated on the stand taken and adhered to, even at some pecuniary loss. Independent purchasers of Kellogg material should be brought up short; such dealings are detrimental to Independent securities since they stand as evidence of poor management and no foresight. Bona-fide manufacturers have thrived since the "Kellogg Sale" was exposed, and one of these plants, that the writer knows of, is the outgrowth of that sale and now makes a better product. So there is no excuse for the purchase of Kellogg apparatus and still less defense for the sale of Independent advertising space to the trust's ally. The latter practice seems to savor of as much treachery as the original "Kellogg Sale."

Yours very truly,

R. M. S., Manhattan.

P. S.—I will anxiously await your next issue.

OHIO DISTRICT MEETINGS.

The executive committee of the Ohio Independent Telephone Association held a meeting at Columbus October 4, at which arrangements were made for the annual meetings of the various districts. The propositions made by the Bell to secure long distance connections with the Independent companies in several cities of the state were discussed, but no action was taken, as it was decided to hold another conference after the district meetings are held. The dates and places of meetings for the nine Ohio district associations are as follows: District No. 1, Cleveland, November 8; No. 2, Canton, November 19; No. 3, Zanesville, November 20; No. 4, Newark, November 21; No. 5, Washington Court House, November 22; No. 6, Toledo, December 3; No. 7, Lima, December 4; No. 8, Dayton, December 5; No. 9, Hamilton, December 6.

AN ENTERPRISING MANAGER.

The victory won by the Home Telephone and Telegraph (Independent) Company over the Bell at New Haven, Ind., is largely due to the industry and good management of William E. Bowers the manager of the local exchange at that place. Some time ago the Bell press bureau sent out a list of "Independent failures" and placed New Haven among the number. The truth is that the Bell has quit the field at New Haven and acknowledged defeat.

William E. Bowers.

Mr. Bowers has furnished TELEPHONY the following account of the campaign there which has recently terminated in a complete victory for the Independent company:

Two years ago the surrounding towns were enjoying the best of telephone facilities while New Haven, with 1,000 people, had two systems and poor service. Many had both telephones in their office and it was not hard to see why people complained of a burden. A toll of ten cents was charged to Fort Wayne, only six miles away, while other counties gave county service free. Mr. Bowers, who was then running the Allen County Herald, asked the Home company to reduce the toll rate to five cents to make up for the lack in service at home, and its refusal brought him into the fight in earnest. Special articles in his paper were given every week and he also made a personal canvass in the country. In two days he secured ninety-four telephone subscribers and then the Bell Company came up with flattering inducements. About July 10, 1905, after a month's work, Mr. Bowers was informed that on August 1 the Independents would give a five-cent rate to Fort Wayne. Not being a telephone man he decided at once to do what seemed to be the best thing for the public. He surrendered his names to the Bell company and gave up the fight. Two weeks later, when the Independents heard that he had discontinued the fight in the paper, they offered him the management of their exchange. He accepted the place, published his reason for discontinuing his own proposed system, and kept in mind that a five-cent rate over Independent lines was better than a free rate over the Bell, as the Bell system was very limited in Fort Wayne where all New Haven business is done. Mr. Bowers passed by the offer of the Bell which was indeed good, and took up the cause of the Independents. During the two years that followed he not only looked after his newspaper, doing all the mechanical and editorial work, but found time to increase the telephone list from 50 to 200. He soon became accustomed to replacing Bell telephones with new instruments of Independent manufacture, but that pleasure was curtailed by the lack of more Bell subscribers. He then commenced negotiations for the purchase of the sub-licensee poles and wire, and on August 1, just two years from the day he assumed control of the home plant, he purchased the Bell property for the Independent company, a little delay being caused in getting papers.

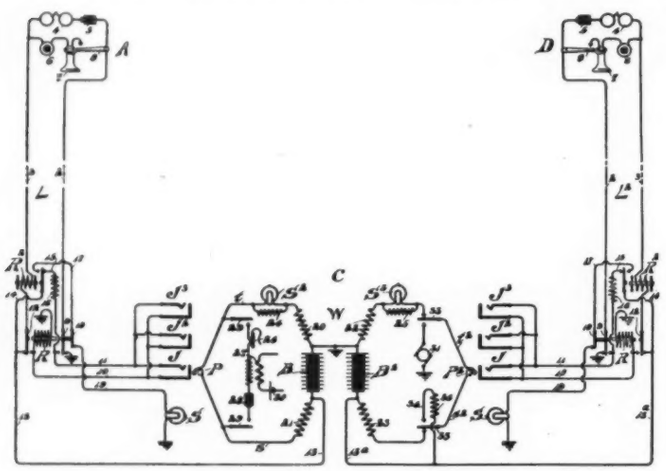
DIGEST OF TELEPHONE PATENTS

By Edward E. Clement

866,036. Telephone Mouth Piece. Knoll. On the diaphragm box of the transmitter is attached a rotatable tube bearing the mouthpiece. The latter can be raised or lowered by simply rotating the tube. Patent unassigned.

866,138. Telephone System. Joeckel. Mutual interference of the circuits of signaling and talking instruments obviated by separating them from one another. The system is designed to improve the bridging and series telephone systems which signal and talk over one line circuit. Patent unassigned.

866,266. Telephone System. Dean. Current from the line circuit is supplied to a signal lamp, placed directly in



one side of the cord circuit, through suitable controlling means. Patent assigned to Kellogg Switchboard & Supply Company.

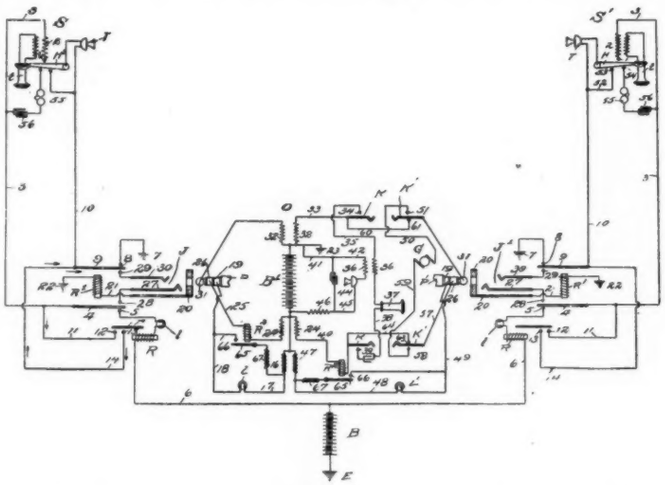
866,577. Telephone Receiver Holder. Brittain. This device is a holder having a universal movement. An attaching plate is provided with an L-shaped arm and adjustable arms secured to the latter, one of said arms having a strap to encircle and hold the telephone receiver. Patent unassigned.

866,639. Automatic Telephone Release. Fales. In this system only one long trunk release circuit is employed, regardless of the number of selectors or automatic switches between the calling subscriber and the connector. This is accomplished by connecting the release relays of all selectors or trunking switches in series with the release magnet of the connector. Patent assigned to Automatic Electric Company, of Chicago.

866,645. Anti-Hummer for Telephone and Telegraph Lines. Hagen. A pliable tube designed to prevent the transmission of noises from the vibrating wire and to serve as an ordinary supporting insulator is provided and is arranged for attachment to a dwelling. Patent assigned one-half to Ole O. Forde, of Pekin, N. D.

866,760. Polarized Ringer Magnet. Whitman. In this device the armature is supported by a yoke held by the cores of the electromagnet and the distance between the armature and the cores may be adjusted by mechanism provided for the purpose. Patent unassigned.

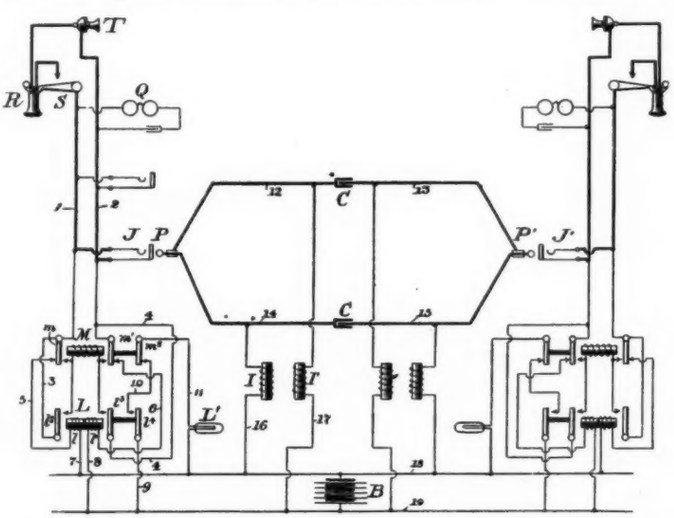
866,714. Telephone System. Clausen. In this system supervision is designed to be absolutely independent of ground at the substation. To this end ringing current is supplied from a bridged generator, the bells being bridged across the lines and condensers being interposed to stop the flow of battery current through the latter, but leaving



them responsive to the ringing currents. Patent assigned to the American Electric Telephone Company.

866,794. Intercommunicating Telephone. Lee. In this system the switch bar or switch plug does not have to be returned to the home connection or position since springs are combined with the switch bar and its connecting terminal points at each intercommunicating station. Patent assigned to Electric Goods Manufacturing Company, of Boston, Mass.

867,014. Telephone Exchange System. Clement. When the line signal is actuated the cut-off relay is brought into

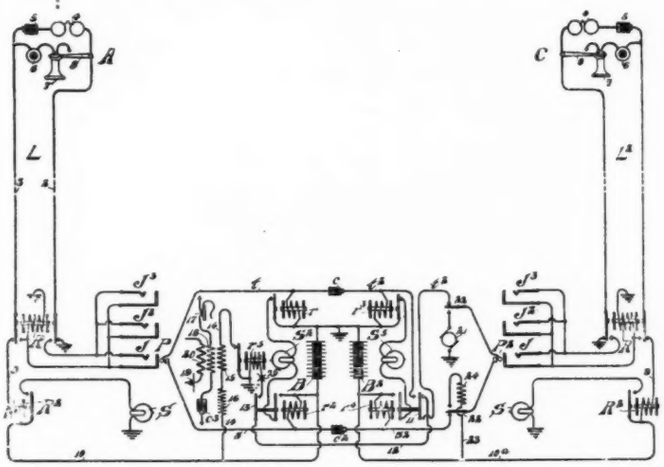


connection with the line. It maintains its own connection and cuts off the line relay which then becomes inert and remains so until the lines are disconnected. Patent unassigned.

867,707. Coin Collector. Craft. After the coin is deposited it actuates a toll indicating mechanism and subsequently is transformed to the line signaling mechanism. Patent assigned to the Western Electric Company.

867,349. Testing System for Telephone Lines. Dean. One object of this invention is to secure the instantaneous response of the testing device. This device is normally

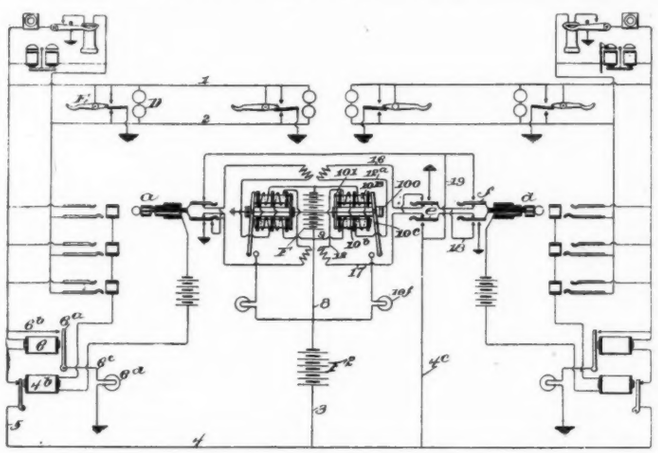
isolated from the cord circuit so that in case of the short circuiting of some of the cord circuits the whole position



is not thrown out of use. Patent assigned to Kellogg Switchboard & Supply Company.

867,746. Coin Collector. McQuarrie. In this device a coin of a certain denomination actuates the toll indicating mechanism and is transferred to the line signaling mechanism. When a coin of like denomination is subsequently deposited in payment of toll, locking means is set in motion to prevent the transfer to the signaling mechanism. Patent assigned to the Western Electric Company.

867,892. Telephone System. Mayberry. In this system the use of a condenser commonly employed in common battery systems is obviated. A circuit including a third conductor, such as ground, constitutes one side of a



circuit momentarily closed when the receiver is removed from the hook, and actuates the signal at the central office. Patent assigned to Boston Telephone Selector Company.

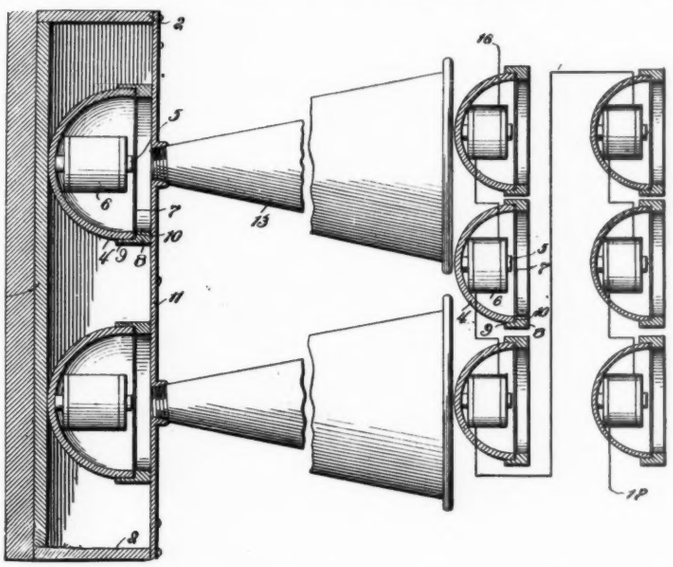
867,895. Wireless Transmission of Sonorous Vibrations McCarty. In this apparatus there is an induction coil having two primary windings and a secondary winding. The current through one primary is adapted to affect the current in the other. An arc light placed in one primary circuit provides a means for varying the current through the influence of an electromagnet energized by vocal impulses through a transmitter. Patent assigned to McCarty Wireless Telephone Company.

867,896. Wireless Transmission of Sonorous Vibrations. McCarty. In this device there is only one primary circuit. Means is provided, however, for varying the current flowing therethrough, the remainder of the apparatus being similar to that described in connection with patent 867,895. Patent assigned to McCarty Wireless Telephone Company.

867,955. Circuit for Coin Collectors. Dixon. In this device the operation of toll mechanism in initiating a call for toll connection, closes contacts in the line signaling circuit. Additional contacts in the line signaling circuit are automatically opened and are reclosed only when the toll indicating mechanism is in its initial position. Patent assigned to Western Electric Company.

868,141. Fuse Box. Stivers. This device comprises a base plate provided with contacts and bearing a fuse carrier which is mounted thereon for step by step rotation. A plurality of fuses on said fuse carrier are adapted to be placed in circuit through their connection with the contacts, at will. Patent unassigned.

868,245. Audiphone. Baker. A plurality of cup-shaped permanent magnets is mounted within a case in close proximity to an equal number of vibrating diaphragms. A sin-



gle conductor leads to an electromagnet fixed within each permanent magnet. Patent unassigned.

868,544. Telephone Attachment. Gordon. This device is intended as an individual mouth piece for its owner. It consists of a disc having a central opening and a marginal flange provided with locking levers so that the auxiliary mouth piece can be applied or removed from the stationary mouth piece of the transmitter. Patent unassigned.

868,594. Attachment for Party Line Telephone. Blythe. The stations are each supplied with a rotatable circuit make and break wheel adapted to be actuated from the central station. This wheel is provided with a main contact pin arranged when actuated to break the circuit through any telephone. The circuit may then be closed through any telephone, when the pin is in the circuit closing position, by continuing the movement of the wheels. Patent unassigned.

THE BUSY RURAL LINE.

Sleepiness caused Harry Evans, a farmer living near Bloomsburg, Pa., a lot of trouble according to the Philadelphia Record. While driving to town in the early morning of July 22, he fell asleep, and his horse wandered into the barnyard of C. O. Maust and aroused some chickens.

Instead of stopping to explain, Mr. Evans, who was in a hurry, drove rapidly away, but found a determined farmer waiting with a gun at every turn of the road. Maust had used the rural telephone to head off the alleged chicken thief, and Evans was held up by fifteen armed farmers before he reached the town. Each time he had to make a long explanation.

REVIEW OF TELEPHONE DEVELOPMENT

An Interesting Article on the Last Twenty Years of Progress, Written for the Western Electrician

By Samuel G. McMeen

ONE way of appreciating what progress has been made in commercial telephony in twenty years is to get before us a general picture of the conditions which existed twenty years ago.

No foreign country has made the advance which has been made in the United States, and it may be well to confine our thought to our own country for the present.

Twenty years ago there were distinctly fewer than 200,000 telephones in use in the United States. No city of under 10,000 inhabitants supported a telephone exchange at all adequate for its needs, and most such cities either had supported an exchange which had declined or had none at all.

Practically all towns having postoffices had at least a toll station, but the limit of "long-distance" conversation was about fifty miles, and the service rather unsatisfactory even at that distance.

Rural lines furnishing service to the suburbs of towns and cities did not exist at all.

The wire plant within and between towns was almost wholly made up of iron or steel wire carried on cross-arms and brackets, and those lines entered the exchanges in most cases by way of house-top fixtures.

These fixtures in the larger exchanges were enormous structures, often occupying the entire roof of the central-office building. The number of buildings owned by operating companies was insignificantly small.

The only general use of cables was in carrying the lines from the roof fixtures to the switching apparatus. These cables joined the outdoor iron wires in a "tower" on the roof, and the point of connection between cables and outside wires was made to serve the purpose of a main distributing frame.

Samuel G. McMeen.

The outside lines and the office cables were all of a single wire per line, as all telephone currents used the earth as a return.

Protective mechanism was limited to a sawtooth open-space lightning arrester or its equivalent; such arresters occasionally stopped lightning charges of moderate strength.

Sub-station equipment was more nearly in a standardized condition than to-day. It is true that the standard was bad and that each set had defects rather clearly recognized at the time, but if there be an advantage in uniformity, it existed at that time. The telephone receiver was of the single-pole type and was associated with a Blake transmitter. The latter utilized a solid carbon button with a polished face, bearing against a rounded platinum stud. A black-walnut box, with a hole in the door for a mouthpiece, contained the transmitter and the induction coil.

The central office was called by a magneto generator, and signals were received, as now, on a polarized ringer, the resistance of which was uniformly about 80 ohms. When a number of stations occupied one line, all the ringers were connected in series. The switch contacts of the magneto-bell outfit were innocent of platinum at any point.

The current for the transmitter was furnished by a single cell of Le Clanche battery.

The amount of maintenance labor to be spent on such lines and such sub-station equipment need not be called to the mind of the older telephonists, as most of them would rather forget than remember. It may be appreciated in a degree by those who have entered telephony in a more fortunate time, when it is said that the life of galvanized-iron wire varied from three to seven years, and that the number of opens, crosses and grounds on a rainy day often reached 20 per cent of the total number of lines in an exchange admitted to be fairly well managed. To this had to be added the attention necessary to keep local batteries renewed, transmitter buttons cleaned and polished, transmitter tensions adjusted, and switch-hook contacts cleaned. If the latter were not done, and well done, the subscriber would be entertained by a continuous sizzling, frying noise, often great enough to prevent commercial conversation.

Of the central-office equipment, it may be said that it was robust enough to give as little trouble as any equipment that has been devised since. The multiple switchboard with an audible busy test was well established, and all of the larger cities were so equipped.

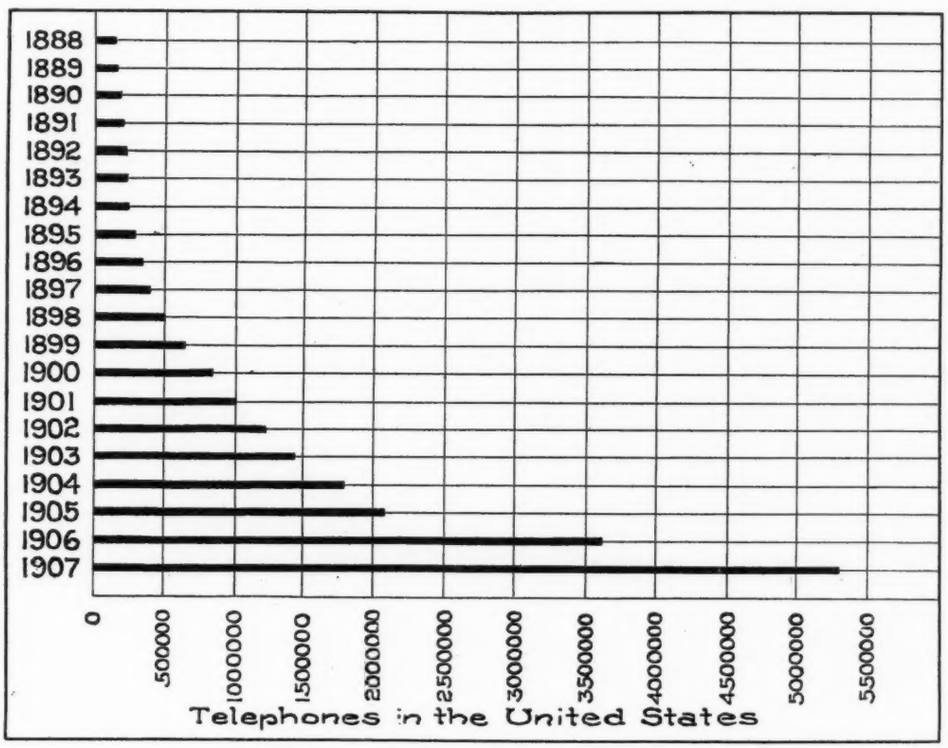
Compared with the simpler transfer switchboard, however, the multiple outfit was costly; and, in addition, a royalty had to be paid on the multiple feature itself. It resulted naturally that there were many fewer multiple boards in the country than good service really was demanding.

The multiple switchboards were varied in type, some having operators' equipments consisting of pairs of cords with listening and ringing keys and others having a single plug and cord per line, each line having its own listening and ringing outfit associated with the cord. These single-

cord boards had many advantages assisting speed of operation, and records have been made on them which compare more favorably with what can be done to-day than would now be imagined. This speed was due, however, not to a convenient and positive system of signals to indicate the state and progress of the call and connection, but to a mechanical arrangement of the keys and cord circuits, which reduced the motion required to make the connection and the disconnection.

The nearest present-day counterpart of a single-cord switchboard is a manual incoming trunk section. If one of the early single-cord boards could have been equipped with automatic signals, such as now are possible, there is no doubt that its performance would have been still more remarkable. But the single-cord type of subscribers' switchboard ceased to be made when metallic circuits succeeded the single-wire line.

In the foregoing I have tried to picture the general aspect of conditons twenty years ago. It is true that metallic circuits were not wholly unknown. The granular carbon (Hunnings type) of transmitter was in sight. It was recognized that platinum contacts must be introduced for hook switches, and that it would be well to improve or abandon the primary local battery. A few traction systems had appeared and the first steps toward curing the difficulties so introduced were being taken.



What has happened since then in the commercial development of the art can well be shown graphically, and I have prepared a diagram stating what probably are the facts as to the number of telephones in the United States year by year. It shows that the number twenty years ago was smaller for the United States than for Manhattan Island to-day. It shows the leisurely growth for the first eight years and the remarkable acceleration since, and it may be that it indicates what we may expect in the future.

If similar diagrams were to be drawn for the growth of long-distance conversations, they would show that the limit of fair commercial transmission has been increased over 2,000 per cent; that the rate of growth in interurban-wire mileage is as remarkable as the growth of telephones in use, and that the conversation-miles per inhabitant per annum have increased at a rate beyond either.

The causes which have stimulated growth in telephone development since 1895 are more than the expiration of the basic patents and the appearance of competition. Probably this competition has been the most powerful cause, but there are mechanical reasons as well. Principal among these are the rearrangement of things which has reduced the complication of the subscriber's telephone and increased that of the central-office equipment; the changes in methods of line construction, the introduction of automatic switching equipments, and of manual switchboards with automatic signals on line and cord circuits.

I have spoken of the early multiple boards as being robust when of the type first introduced. Somewhat less than twenty years ago, however, as the number of subscribers' jacks required to be placed within a section within the operator's reach began to become very large and the spring pressure per jack to grow small, the presence of series contacts in such jacks introduced a new and serious trouble. A good many ways of reducing or avoiding this trouble were tried, but the solution most successful was the entire elimination of all contacts required to close the line through the jack on the withdrawal of the plug. A rearrangement of circuits was necessary, resulting in the "bridging" or "branch terminal" switchboard, with automatically self-restoring and locking drops.

Many such switchboards were installed, most of them being equipped with the additional refinement of an intermediate distributing board, enabling the traffic of the office to be readjusted from time to time so as to even up the work of the various positions.

In an effort to avoid the large cost and royalty expense of multiple switchboards, there was produced on the Pacific coast, at about the time of the advent of the bridging multiple board, a local trunking or transfer switchboard, equipped with automatic signals Its performance aroused sufficient interest to cause its operation to be studied in detail, with the discovery that the important advantage lay not so much in the use of local trunks, or transfer circuits, between parts of the switchboard (as a substitute for a multiple of the lines), as in its use of automatic signals. It was then but a simple step of logic to the conclusion that if automatic signals were to be applied to the multiple switchboard a maximum of advantage would be gained.

At that point the present type of common-battery multiple equipment came into existence, and what has been done since upon it, while of great value, has not been revolutionary in any way.

The conditions required for the operation of automatic line and supervisory signals fitted in so well with the requirements for supplying the subscriber's transmitter with current from the central office that common-battery transmission came into being almost as a matter of course.

The earliest commercial installations of automatic switching equipments were made before the expiration of the basic

telephone patents, and the early development of the automatic art was about contemporaneous with that of the branch-terminal magneto board. Viewed in the light of total accomplishment, the development of automatic switching equipment is quite as remarkable as any other phase of the art; and more so in view of the strong prejudices which had to be overcome, the continuous discouragements which were met, and probably the difficulty of prosecuting the development with so little support from the telephone-consuming public.

It is interesting to note that while in manual telephony the present grade of central-office service only has been reached by abandoning the local trunking system and adopting the multiple system, in automatic telephony the opposite is true.

The earlier automatic equipments were all of the multiple type, and the large automatic equipments of to-day only are possible because the multiple feature has been discarded and the complete local trunking arrangement adopted in its stead.

With an equal possibility of a high quality of voice transmission; with the marked advantage of instantaneous disconnection; with the ability to handle the largest groups of subscribers' lines and to care for private-branch-exchange service, an automatic system is to be considered one of the great certainties of future telephone equipment.

The principal changes in sub-station equipment in twenty years have been the provision of platinum contacts; the change of ringers from a low-resistance series type to the high impedance bridging type, and the provision of a granular carbon transmitter free from the tendency to pack and with a great range of resistance-change when spoken into. The adoption of the bipolar type of receiver also has improved the equipment in a small degree.

Just as metallic circuits were a rarity twenty years ago, so grounded circuits are the rarity to-day. The reasons for this radical change, practically doubling the wire plant for a given number of lines, were three.

One of them was the arrival of electric traction, whose return currents made telephone lines extremely noisy and caused unbearable false signals; another was the limit placed on long-distance speech by the noises in grounded lines from earth currents and atmospheric charges; the third was the cross-talk between neighboring lines when carried as grounded circuits in cables of more than a few hundred feet length.

This rather complicated group of reasons is a fairly good instance of the causes of change in all branches of telephony.

The McCluer system of common wire returns as a substitute for ground returns helped out the electric-traction difficulty very usefully, but was of no advantage in solving the other two problems. The enormous masses of open wires in the streets were causing the operating companies to wish, and the municipalities to demand, some other method of distributing telephone lines. After a short time of denying it to be possible, the inevitable underground system appeared, and there are more telephone wires in the earth to-day than there were above it a dozen years ago.

But even with a pair of wires shut up in a cable within a lead sheath in a duct in the ground, with all external disturbances excluded, the line problem was not solved. Indeed, a new difficulty had been introduced. This was the substantial increase in the electrostatic capacity of the two wires forming the line, and with the clearly articulating but low power Blake transmitter the short-circuiting effect of this capacity amounted to a very hurtful loss. A solution of this new problem came in the paper-insulated, highly aerated telephone cable of present practice. A still further and most admirable solution was contributed by Dr. Pupin, which inserts an inductance in series with each wire of a pair to neutralize the effect of the capacity across it.

The effect of such a series of inductances upon the electrical voice waves is so similar to the effect of a molar loading of a light string upon "string-waves" that the treatment of a telephone line by Pupin inductances has come to be called "loading."

Lines in a given cable can be worked for greater lengths at a given loss when loaded, and the result is a new series of economy factors in laying out the many central offices of a city, and the adoption of underground instead of aerial long-distance trunks between cities many miles apart. As a matter of comparison it may be noted that it is possible to talk farther through an underground cable of small copper wires to-day than one could talk over an open aerial circuit twenty years ago. It is not apparent why all interurban trunks ultimately may not be placed in the earth.

The advantage of an entire underground system of loaded trunks between cities is not merely a reduction of interruptions and the elimination of pole decay. The principal gain is in the nearly uniform hurtful capacity effect to be cured and the almost absolute certainty of uniform transmission.

Inspired by the success of repeaters in long telegraph trunks, a telephone repeater for a similar assistance has been dreamed of. One inventor seems to have remembered the dream after waking, as the commercial success of the Shreeve repeater has at least shown that a repeater is not impossible. Whether the perfected repeater will co-operate with line loading on long circuits, supplant it, or render it unnecessary, furnishes an interesting field for speculation.

The operation of telegraph and telephone service over the same wires at the same time, in successful operation for many years past, has had the effect of reducing the financial burden which long-distance telephone circuits otherwise would need to carry. It is now possible, under favorable conditions, to work each side of a long-distance pair quadruplex and the pair itself for speech.

No record of the principal features of the development in telephony should omit to note the opportunity of a switching system combining the best features of manual and automatic equipments; the very valuable investigations in electrical acoustics made possible by the use of the oscillograph, and the recent advance in radiotelephony through the use of energy in the form of Hertzian waves.

I have confined my attention so far to conditions in the United States. Growth in other countries has been less rapid than here, and the methods and appliances have been less well developed. For some years, however, Sweden led the world in density of development of the larger cities. This is not now true, as there are a number of American cities with a ratio of telephones to population greater than in any Swedish city.

The literature of telephony is an excellent index of the progress which the art has made in twenty years. The telephone man's library of long ago consisted of a single volume, written by the dean of telephone engineering, Mr. Thomas D. Lockwood. To-day a library of telephony occupies several shelves, and one may receive half a dozen periodicals exclusively devoted to the art.

Free telephones in railroad stations will be permitted by the Nebraska railway commission temporarily, at least. The commission has strained a point and will allow a continuance of the old arrangement against which complaints have been brought on the ground that it is discrimination in favor of the railroads to let them have their telephones free of charge. The argument has been advanced that the railroads do not get the telephones free, but give wall space for the instruments in exchange and also donate the time of their agents in answering calls. This is the theory on which the commission has decided that for the present it will not undertake to make the railroads pay.

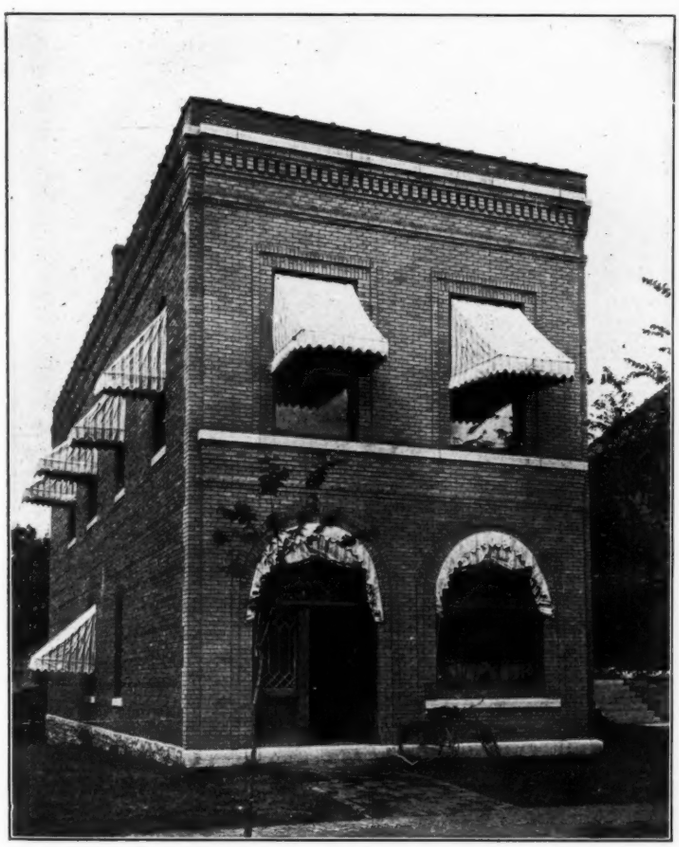
KANSAS CITY LONG DISTANCE COMPANY

This Independent Concern Operates Five Successful Exchanges in Kansas and Missouri and is Growing Stronger Every Day

By C. D. Wright

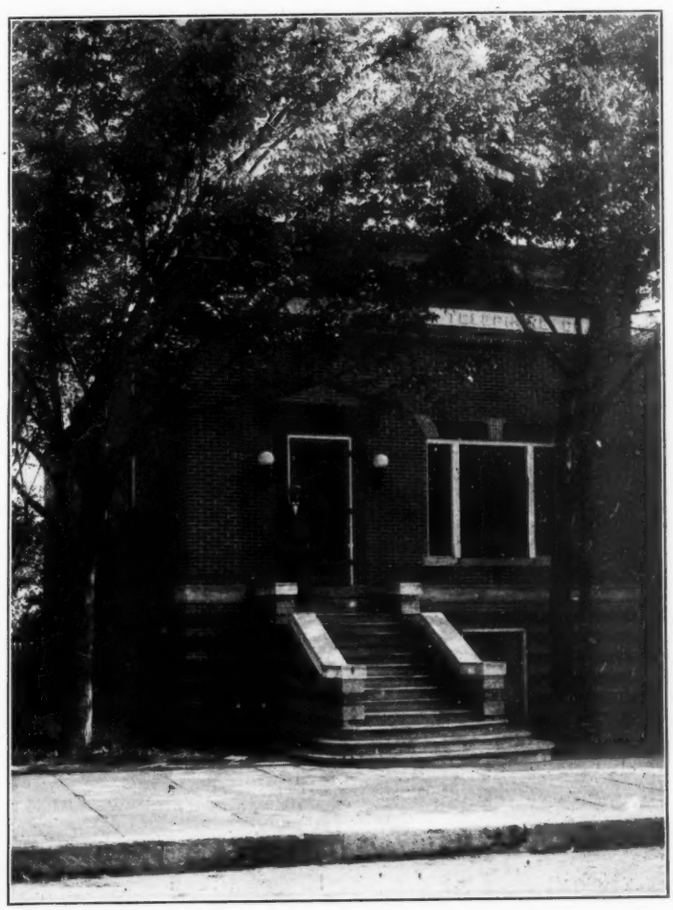
THE growth of Independent long distance business in Missouri and Kansas, as well as throughout the central portion of the United States, is truly remarkable. Only a few years ago the Bell telephone trust was in complete control of toll business and used its toll line advantages and standardization as an argument in support of the natural monopoly theory. Now, however, Independent companies are spreading a net-work of lines over the country at a rate so rapid that it is considered only a question of a very short time until Kansas City has direct communication, over friendly wires, with both the Atlantic sea-board and the Pacific coast. The Kinloch Company goes east to Terre Haute, Ind.; the New Long Distance Telephone Company, of Cleveland, connects with Indiana points, with all parts of Ohio, and with Michigan and Kentucky, then stretching out eastward, unites with Pennsylvania.

The Kansas City Long Distance Telephone Company (Independent) which meets the Kinloch at Sedalia and Nevada, has 4,000 miles of toll lines in Missouri and Kansas, and reaches the principal cities and towns in both states, in addition to those of Nebraska and Iowa. Its service is fully as



Lawrence (Kansas) exchange.

prompt as that of the Bell company and is much more satisfactory to the public. Since the beginning of operations in April, 1904, the number of messages transmitted has been far in excess of that of the Bell people in the same localities. Owing to the increase of business, switchboard facilities at Kansas City have recently been almost doubled. Important extensions in various directions, under the supervision of C. J. Myers, superintendent, and J. H. Rogers, chief engineer, are now contemplated. In view of the remarkable develop-



Independence (Kansas) exchange.

ment of Oklahoma, there will also be much building toward the southwest.

In matters of construction, the company has adhered strictly to the highest standards of materials and workmanship, and has not been disappointed in the results. It owns five large exchanges outside of Kansas City, each of which is on a good paying basis. Three of them have been rebuilt and the predictions of the Bell trust to the effect that the charges of Independent companies are too low to admit of adequate improvements have been shown, again, to be erroneous.

The Independence (Kansas) plant is in a most flourishing condition having eighteen hundred subscribers and the good will of the entire community. Thoroughly modern equipment, efficiency and dispatch have won unqualified approval. Ottawa (Kansas), equally well managed and patronized; Lawrence (Kansas) and Excelsior Springs (Missouri), with lists of twelve hundred and eight hundred respectively, and Richmond and Norborne, Missouri, are reap-

ing the just reward of consideration for the rights of citizens.

The officers chosen at the recent election—O. C. Snider, president; J. J. Heim, vice-president; and Hugh C. Ward, secretary and treasurer—are widely known as successful telephone men whose ideas with reference to financial policy are in harmony with the most approved methods of dealing with corporation affairs. Hence, they are certain to make ends not only meet but lap over to such an extent that the company will continue to pay excellent dividends. E. L. Barber of Ohio, connected with the Barber-Powers combination, and Lee Benoist, a St. Louis capitalist, are among the large shareholders. The real conditions are, after all, completely at variance with the Bell prophecies of embarrassment and failure, and time will unquestionably prove still more clearly that it is entirely possible to earn fair profits and furnish telephone service at reasonable rates.

Since the rise of Independent telephony, the attempted monopoly of long distance service has been the saving feature of the Bell business, and now that competition in all parts of the country stares it in the face at exceedingly close range, the consequences are not difficult to determine. Harmonious local relations have much to do with the growth of any enterprise. Extortionate rates never produced continued prosperity. The moral to the whole story of the telephone trust is that greed and intolerance cannot, in the end, win out; that integrity and justice, with the approbation of the people, are more valuable assets than millions of dollars obtained by grinding and oppressing the public who foot the bills.

FEATURES OF THE ELECTRICAL SHOW

International Independent Telephone Association Will Hold Its Annual Convention There January 21-23

By A. D. Blocker

TELEPHONE MEN throughout the United States and Canada will be interested, and, we believe generally pleased, when they learn that an arrangement has been effected whereby the next annual convention of the International Independent Telephone Association will be held during the next Electrical Exposition which is booked for the Coliseum, Chicago, January 13th to 25th.

The Chicago Electrical Exposition already has established a reputation throughout the length and breadth of the nation as being the most successful show of the kind ever presented in America. All of the big manufacturers of electrical apparatus exhibit at this show their latest and most interesting products. All of the manufacturers and dealers in specialties, supplies, etc., are also there in force.

A birdseye view of the Chicago Electrical Show, held in January, 1907.

The exhibits are tastily arranged, handsomely decorated and, as is natural for an electrical show, brilliantly illuminated night and day by myriads of electric lights of every description. The finest music is also provided for this

exposition, last January's event enjoying Ellery's band, while the one in 1906 was graced with the presence of Weil's famous St. Louis Exposition band.

TELEPHONY presents herewith a birdseye view of part of last year's exposition from which the reader can gain some idea of the magnitude and general character of this event.

A very elaborate scheme of booth construction and decoration has been adopted for the coming show, which will provide a more symmetrical and pleasing arrangement of exhibits than has been possible heretofore. All booths will be furnished and installed by the exposition company.

Added to the attractions which the Chicago Electrical Show has heretofore enjoyed, it is announced that this year, for the first time, arrangements have been perfected whereby the twelfth annual convention of the International Independent Telephone Association will be held on three days, January 21, 22 and 23, during the exposition.

Homer E. Niesz,
Manager Electrical Trades Exposition Company.

Furthermore, the Coliseum Annex, situated just south of the Coliseum proper and directly connected with the same by several large passageways, has been set apart exclusively for the use of telephone exhibitors, and, within a few days after it had been decided to hold the telephone convention during the Electrical Show, all of the larger and better spaces in this annex had been reserved by manufacturers of telephone apparatus. This department accordingly promises to be one of the exposition's most interesting features. It is assured that the attendance at the telephone convention will far exceed that of any previously held. All of the sessions will be held in the Annex Hall, a large assembly room immediately above the telephone exhibits. The importance of the double attraction this year is such that visitors will flock to Chicago from all parts of the country. As the exposition comes at a time of year when those who intend building and buying apparatus of any kind during the coming season ordinarily begin to cast about them for information, it may be safely assumed that a great percentage of the attendance at this event will consist of those who are prospective purchasers of equipment and supplies.

The last Electrical Exposition was visited by approximately 200,000 people and over 35,000 square feet of space was occupied by exhibitors. With the added attractions of the telephone exhibits and telephone convention this year, the above figures will be materially increased.

We present herewith a partial list of the manufacturers of telephones, telephone apparatus and supplies who have reserved space up to the time of going to press:

American Electric Fuse Company.
American Electric Telephone Company.
Automatic Electric Company.
Century Telephone Construction Company.
Central Telephone & Electric Company.
Chicago Telephone Supply Company.
Corwin Telephone Company.
Dean Electric Company.
Frank B. Cook Company.
Graeber-Entriken Manufacturing Company.
Hepburn Telephone Company.
International Telephone Manufacturing Company.
Monarch Telephone Manufacturing Company.
North Electric Company.
Sterling Electric Company.
Stromberg-Carlson Telephone Manufacturing Company.
Stoltz Electrophone Company.
Swedish-American Telephone Company.
Vote-Berger Company.
TELEPHONY will have a booth as usual.

Those who wish to keep informed regarding all that is latest and best in the electrical and telephone fields should begin making arrangements now so that they may not fail to attend the Chicago Exposition, January 13th to 25th.

Full information regarding accommodations, attractions, etc., can be had promptly by addressing Mr. Homer E. Niesz, manager Electrical Trades Exposition, Monadnock block, Chicago.

WORK IN CALIFORNIA.

From Arcata, California, TELEPHONY has received an interesting letter from J. H. Blake about his telephone line construction work in the wonderful Humboldt county territory. Since May Mr. Blake has been busy building new lines, installing telephones and doing the necessary repair work. He has crossed Mad river at Blue Lake, making two spans of about 2,000 feet each on the line from Blue Lake to West End and Warren Creek. This line is complete as far as Warren's now, later will be extended to Arcata, thus making two separate lines between Blue Lake and Arcata, one on each side of the stream. In crossing the river at West End Mr. Blake elevated the wires sixty-five feet, so that the sag is about forty feet above high water. He will have a cut-out station at Leavey's so that in case the line should be broken over the river the broken part may be switched off, allowing the subscribers to talk with the others, and through the Arcata Central back to Blue Lake and other points. Nearly every resident along this route has subscribed to two-year contracts which goes to show that the people are alive to the value of telephone service.

THE PENNSYLVANIA CONVENTION

Independent Telephone Men of the Keystone State Held Their Annual Meeting at Harrisburg Oct. 16-17

By A. B. Turner

THE Independent telephone men of Pennsylvania proved anew their unswerving loyalty to the anti-Bell movement at their fourth annual convention which was held at Harrisburg October 16 and 17. The meeting was the most successful of any convention held by the Pennsylvania association, and was largely attended. A resolution was adopted prohibiting any member of the association, on pain of dismissal from the association, from purchasing any telephone apparatus from the Western Electric Company, notwithstanding the fact that the Bell manufacturing ally has decided to seek Independent patronage at any cost. By this action the Pennsylvania Independents reject in advance the overtures of the Bell interests to establish more amicable relations for the purpose of worming their way into the Independent field. The association also decided that all affiliated companies shall continue the low night rates for long distance telephone service. The Bell has abolished the night rate but the Keystone (Independent) Company, of Philadelphia, has found it practicable not to follow the Bell lead and the state association endorsed this policy.

The Pennsylvania convention met at 10 o'clock, October 16, President Charles West, of Allentown, secretary of the International Independent Telephone Association, presiding. E. Z. Gross, mayor of Harrisburg, made the opening address and extended the delegates a hearty welcome. Mayor Gross eulogized the Independent telephone movement and said it had done much for the people of Harrisburg and the surrounding territory, by giving them adequate telephone service.

W. H. Denlinger, of Patton, responded on behalf of the association and made mention of the fact that Independent telephone companies are financed by local capital, instead of by distant capital as is the case with the Bell licensees.

"We are here to-day," said Mr. Denlinger, "to bear in mind this one thought, and it is one that I would like to emphasize, and emphasize most emphatically, that the local interests represented here should have some recognition throughout this great state. Every man here represents some particular locality. He himself has shown his confidence in this great movement by investing his own hard dollars in this enterprise, and such has been the success as to warrant a continued investment. I predict to you that when we come back here again, as we will, because we have been so royally received, instead of having 200,000 telephones in Pennsylvania, inside of five years we will have half a million."

The association then listened to the annual reports of the officers. President West's report contained a summary of the year's work and referred to the successful efforts of the association in preventing the passage of proposed legislation contrary to the interests of the members. Mr. West also urged the advantages of membership in the International association, saying: "The International association is accomplishing a great deal of good for the Independent telephone industry all over the United States, and I cannot too strongly urge upon you the necessity of attending the annual convention of that association and getting in touch with its aims and purposes, which are similar to those of this association." He urged the Independent companies to advertise their long distance facilities by a continuous and vigorous educational campaign.

In making his report Secretary H. E. Bradley, of Philadelphia, said that in the past year the prosperity of the Independent companies has been general and steady. In the toll line business there was an increase of twenty per cent over that of the previous year. There are now 200,000 Independent telephones in the state, 331 exchanges and 2,238 toll stations. Better and more toll lines are needed, he said, to effect better returns in the business.

The question of admitting to the association the Independent companies of Delaware, New Jersey and Maryland was then brought up. F. A. Demarest, of Trenton, and C. E. Wilson, of Philadelphia, spoke in favor of admitting them. There was some discussion, and the following committee was appointed by the president to consider the merger: H. E. Bradley, Philadelphia; E. D. Schade, Johnstown; W. H. Denlinger, Patton. This committee reported favorably the next day and the report was unanimously adopted. The admission of these three states will increase the association's membership thirty-five companies, representing approximately 30,000 additional telephones.

The resolution dealing with the Western Electric Company's efforts to break into the Independent field was couched in no uncertain terms. The preamble declared that the Western Electric Company is a subsidiary of the Bell combine, has harassed the Independent interests wherever possible, and then said: "The said Western Electric Company at the dictation of the American Telephone and Telegraph Company now offers to sell its wares outright to the Independent companies at cut prices with the object (if we may believe the press reports) of getting a footing with said companies so as to ultimately assist the American Telephone and Telegraph Company in disrupting the spirit of co-operation that exists between said companies through their state associations and the International association, and with the object of equipping such Independent companies as may buy from them with Bell apparatus so that they may eventually be connected with the Bell system. This move is only a stepping stone with that end in view."

The resolution then declared it to be the sense of the convention that its members "will not purchase or use, nor connect with any company that does use, Bell telephones, switchboards or equipment made by the Western Electric Company and that any member so doing shall be immediately expelled from the association."

Several interesting papers were read, including one on "The Value of Independent Telephone Securities as an Investment," by J. C. Kelsey, of Chicago. Mr. Kelsey's paper follows:

Only a little while ago a prominent dealer in public utility securities, who studies every detail and who is conservative and safe, informed me that it was his opinion of securities from the standpoint of their market values, stability and certainty of dividends. First in his list he placed water; second he placed the telephone; third, electric railways, and fourth, electric lighting.

His opinion merits our serious attention. I naturally wondered upon what basis he made his deductions, but did not ask him for his reasons. After some study on the subject, the conclusions of my friend seem to be most logical.

We will all agree that water securities are good. The habit of using water is not a fad; it is a real habit. No one can see why any water property should fall into disuse, or be affected by hard times, or in any manner be influenced by evil or contrary conditions. It will always be a necessity with which to sprinkle the streets; to quench conflagrations and to furnish the basis of steam for our numerous factories and plants. No substitute for water has ever been found, or is apt to be discovered. We must have it to drink; it is essential for cleaning, and Bridget could not prepare our meals without it.

Electric railway properties are good, too. They have fine roadways, strong bridges, good power houses, and enduring rights of way. Their whole being seems to partake of permanency and strength. Ease in transportation is the greatest factor in our safety as a nation. Troops can be mobilized rapidly, and the foe cannot penetrate our interior.

Electric lighting securities are also good. The large city systems are certainly making money. Civilization and light go hand in hand. None of us anticipates or desires a return to darkness. We all know how futile it is to get something for nothing, and thus we may be sure that the great boilers and rotary engines will always have to work to make light. We have, therefore, the assurance of durability.

But telephone securities are especially good, and I propose to demonstrate the fact. We are practically convinced that the telephone is a substantial institution. Of all the methods of transmission of intelligence, the telephone stands first in convenience and usefulness. Nothing can be more satisfactory than talking direct to your customer or your family, far or near. Will anything supplant that? Your imagination fails to reveal a substitute.

A delicate law of nature has been harnessed, as it were, and serves the public in a manner that brings it close to their hearts. I never so much appreciated the beauty of the telephone as when I saw the homes of the Dakotas, lying two miles or more apart, sometimes buried deep in snow for several weeks, and surrounded by howling blizzards. Imagine how welcome must be the signal of the telephone bell, and the sound of the neighbor's voice in the telephone receiver!

Here is a telephone subscriber who is learning that this same neighbor's voice is cheering his hardworking wife, and is tending to close the gates of the insane asylum to her. You all know that endless work and solitude deadens the mind. Solitude and insanity are closely allied. Do you think that this element of our industrial citizenship will quit the use of the telephone? I do not think they will.

We know how the farmer quickly gets the physician for his sick child; the veterinary for his ailing stock; the repair man for his threshing machine; the grain dealer for the best price of cereals, and then we realize that the farmer will not dispense with the telephone. It is said that the women subscribers arrange their hair before they answer the telephone. Surely, this is proof that the telephone has a share in human affections. The telephone is a personal, animate thing, and has become a fixed part of our lives. It will be the last convenience to go should hard times grasp the land.

The small town and the large city face these same conditions on a larger scale. The towns furnish the basis of long distance business, and the large cities make a demand for leased wires. There is no reason why any of these conditions will change. More probably, even newer methods of using the instrument will enlarge the opeartors' field to supply service. Telephone companies are remarkably free from damage suits. Electric railways are not so fortunate. Only the other day, an electric railway in Illinois killed fourteen people and frightfully maimed seventy-five more. Following this dreadful calamity, we beheld the spectacle of a United States judge and a United States senator,—both said to be directors,—standing by and watching this road thrown into a receiver's hands for an alleged debt of $5,000, in order that they might not be liable for the thousands of dollars' damages. In a single moment the stockholder in this property lost his all. Do you know of a single telephone company in such a predicament? Not one. In the handling of freight and express, goods are frequently stolen, damaged or lost. These items cost the transportation company much money. The employment of regular watchmen and special detectives alone is a great item of expense, obviated entirely in telephone work, because the exchange is never left alone from its inception to the end of time. Telegraph companies have many troubles, and are continually in the hands of the courts. The telephone company assumes no similar responsibilities. It simply makes a reasonable effort to connect the proper parties for conversation.

Telephone companies do a cash business. The absence of large individual accounts enable the management to see at a glance the true condition of the company in question. There is no chance of any single failure precipitating a like condition in the telephone company. Telephone companies make use of staple materials, such as copper, lead, iron and hardwood. This has a very decided bearing upon depreciation. A railroad company has one item of ties, which possibly may be compared to poles. However, as poles are a hundred feet apart and ties two feet or less, and the decay ten times as rapid with the ties, the telephone company can hardly be said to be at a disadvantage.

The question of depreciation funds in connection with a telephone plant is distinctly different and unique. Railroads can invest their reserves in tie properties, in coal lands, or in some industry which will give them direct results. The telephone company is by nature compelled to keep its cash renewal reserve in bank, at a low rate of interest. However, being cash, it has the decided advantage of immediate usage. It costs something to borrow money on tie property or coal deposits.

The question of the amount of money to be set aside for depreciation is not difficult. Our Bell friends, or enemies,—as you please,—have always deplored the lack of it in Independent telephone companies. So far, I have been unable to find a single Bell company that comes anywhere near the renewal reserve charge of the Keystone Telephone Company, which is $4.00 per station.

Not only does this property maintain a cash reserve, but, like all Independent telephone companies, it does not have to pay a parent company 4½ per cent of its gross earnings as a royalty tax. This absurd condition of paying the parent Bell company 4½ per cent holds through all Bell licensee companies, and is merely a device for fleecing its dwindling number of minority stockholders. The payment of this percentage of gross earnings cannot be justified on any grounds known to man.

I think a great deal of the Bell's trouble,—for example, its huge floating debts,—come from imbecile advice given by alleged experts. What good can come from a Bell expert, reared in Boston, and occasionally visiting that Mecca of all Bell engineers,—the New York Telephone Company, when he advises the Missouri, Nebraska, California and other licensee officials how to act.

No monopoly employe can be truly expert. He is biased, and is ignorant of real conditions. Not facing active competition, he has about as true a grasp of the real situation as the new babe has of the world. Independent telephone companies have employes not only more efficient, but more loyal. I think, as a rule, Bell employes waste more material than they use, out of pure hatred of the system. The Independent employe has a spirit of helpfulness and as a result lines are built at a lower cost, and exchanges are operated more efficiently and economically.

All in all, Independent telephone securities should not be second in any list. They should rank with the very first. The commodity dealt with is of a permanent nature. It is

clearly understood. It has no terrors and will not run amuck. The cost of operation and maintenance of telephone systems is reasonable, and depreciation is exceedingly moderate. The first cost of construction is not relatively great, and the returns are prompt and regular. Therefore, with small investment and low cost of operation, maintenance and depreciation, the telephone furnishes a stable security.

Not only is the security of an enduring nature, but its market value has been demonstrated in the last year where other stocks have depreciated terribly. Some three billion dollars have been squeezed out of the listed stocks; yet even the Bell securities have held their own, in spite of years of mismanagement.

In every community, Independent securities have been unmolested. Surely, this is a test, vigorous enough to convince any skeptic. The certainty of dividends has been proved. Very few companies have failed, although the development has been largely of a primitive nature. Rates have been raised where necessary, and the fact that people are generally willing to have them raised is a most satisfactory condition. Almost every company has it in its power to raise rates, if the people are taken into its confidence.

Anticipating that hard times may come, the decreased cost of materials and labor, which always accompany such conditions, will offset all losses due to its scourge. Circumstances seem to point to an equalizing process so that hard times will not affect the financial standing of the telephone.

Lastly, the idea of competition. For instance, a single railroad company connects two large cities. Before long, a competing system builds a railroad. Finally three, four or five railroads are competing for the same business. Last of all, interurban electric roads parallel the various steam roads, and kill their local business. It is plain to the observer of social conditions that there will not be more than two long distance telephone companies in competition, because the various towns and cities will not submit to more than two local plants. Accordingly, the world's telephone business will be limited to two companies.

It is said that the telegraph companies intend to go into the telephone business. If they do, they will have to get city exchange terminals. One cannot imagine that the American Union Telephone Company would be eager to grant exchange terminal privileges to concerns which propose to compete with its long distance wires.

With all these conditions in mind, I am sure all financial interests will place the telephone security first from the standpoint of market value, permanency and certainty of dividend paying power. I am also very sure that the value of the Independent telephone security is greater than the most optimistic gentleman suspects, and that, at the lowest estimate, is not worth less than one hundred cents on the dollar.

Following Mr. Kelsey's paper, T. B. Lee, of Washington, read a paper on "The Independents in Green and Washington Counties," and, S. C. Thayer, of Rochester, read one on "What We Are Doing in Beaver Valley."

The following committee on nominations was appointed: J. F. Stockwell, Philadelphia; W. P. Beardsley, Harrisburg, and G. B. Rudy, York. The committee made the following report which was adopted: President, F. D. Houck, general manager American Union Telephone Company; first vice-president, C. E. Wilson, general manager of the Keystone Telephone Company, Philadelphia; second vice-president, J. G. Splane, president of the Pittsburg and Allegheny Telephone Company, Pittsburg; secretary, H. E. Bradley, secretary of the Eastern Traffic Association, Philadelphia; treasurer, Charles West, general manager of the Consolidated Telephone Companies of Pennsylvania, Allentown. This will be Secretary Bradley's fourth year in office, he being the only man who has ever held that position.

The following were appointed delegates to the International association convention in Chicago, next January: C. E. Wilson, N. T. Folwell, J. F. Stockwell, Philadelphia; Charles West, Allentown; C. W. Kline, Hazelton; E. D. Schade, Charles Griffith, Johnstown; J. G. Splane, Frank Hart, Pittsburg; W. H. Denlinger, Patton, Cambria county; G. B. Rudy, York; W. H. Willson, F. D. Houck, W. L. Malin, Harrisburg, and T. B. Leo, Waynesburg.

The annual banquet of the Pennsylvania association was held at the Board of Trade auditorium the evening of October 17, and was attended by 200. B. F. Meyers, vice president of the American Union Telephone Company, acted as toastmaster. The arrangements were made by a committee consisting of W. P. Beardsley, W. Scarlett, and W. L. Malin, of the Harrisburg office of the American Union, and the spread reflected credit on their efforts. The decorations were unique, and included two telephones at either end of the stage, equipped with wires, cables, guys and all other equipment regularly seen on the highways. A screen of autumn foliage from the woods lent a realistic touch to the scene and formed a screen for the orchestra. Startling electrical effects were worked out in the design, chief of which was a blazing shield. The "insulators" on the cross-arms were green incandescent lights. Whenever a speaker indulged in an ancient joke every light in the hall went out, a huge telephone bell rang loud and long and "chestnut" blazed for an instant on a black background. The decorations were the work of C. E. Markle, foreman of the switchboard shop of the American Union. The ices were served in miniature wall telephones, the boxes forming appropriate souvenirs. The table decorations were asters, roses, and Boston ferns, with red carnations as boutonnieres. Among the toasts responded to were: "Common and Preferred," Colonel J. L. Spangler; "Our Legal Rights—What They Are and What They Should Be," C. W. Kline, of Hazleton, and Nathan Forwell, of Philadelphia. A silent toast was drunk, standing, to W. D. Barnard, of Philadelphia, deceased, late president of the old United Telephone and Telegraph Company.

The convention manifested a determined and confident spirit and was productive of much good.

MICHIGAN MANAGERS' CONVENTION.

The Independent Telephone Managers' Association of Michigan will hold its annual convention at Battle Creek, Michigan, November 13 and 14. An interesting and comprehensive program has been prepared. J. P. Boylan, traffic manager of the Home Telephone Company, Detroit, will present a paper on "Suggestions as to the Best Methods of Handling Through Toll Business." H. E. Custard, special inspector of the Citizens' Telephone Company, of Grand Rapids, will deal with "Testing and Locating Troubles." H. R. Smith, manager of the Homer Company, will tell of "Switchboard Troubles," and C. L. Patee, manager of the Union Telephone Company, Mt. Pleasant, will discuss "Line Troubles." V. R. Cummings, manager of the Citizens' Company, Bellevue, will speak on "Instrument Troubles." M. H. Porter, manager of the Peninsular Company, Northville, will read a paper on "What Information Should the Inspector Impart to the Patron?" and W. S. Vivian, secretary of the Michigan State Association and editor of "The Association Bulletin," will also discuss that subject.

The question box will be in charge of A. A. Burch, C. E. King and W. B. Serviss. There will be routine business, election of officers and a smoker for members the evening of November 13.

The officers of the managers' association are: F. V. Newman, Grand Rapids, president; William Robinson, Muskegon, vice-president; M. T. Clough, Owosso, secretary and treasurer.

MODERN TOLL SWITCHBOARD EQUIPMENT

The Continuation of a Series of Articles Dealing with this Important Subject

By J. E. Hilbish, J. B. Thiess and G. A. Joy

ARTICLE VI

IN THE preceding articles we have discussed all the toll systems excepting that in which a lamp equipment is used, and, consequently, we are now ready to study the highest state of development attained in toll switchboard apparatus, namely, "the lamp signal equipment." This type of an equipment is commended for many reasons, chief among which are the facts that it facilitates the handling of toll calls with greater speed, the apparatus necessary in the face of the board is condensed and, consequently, brings it within easy reach of the operator, the ready and absolute application of the visual busy test, as well as many others touched upon in previous articles of this series.

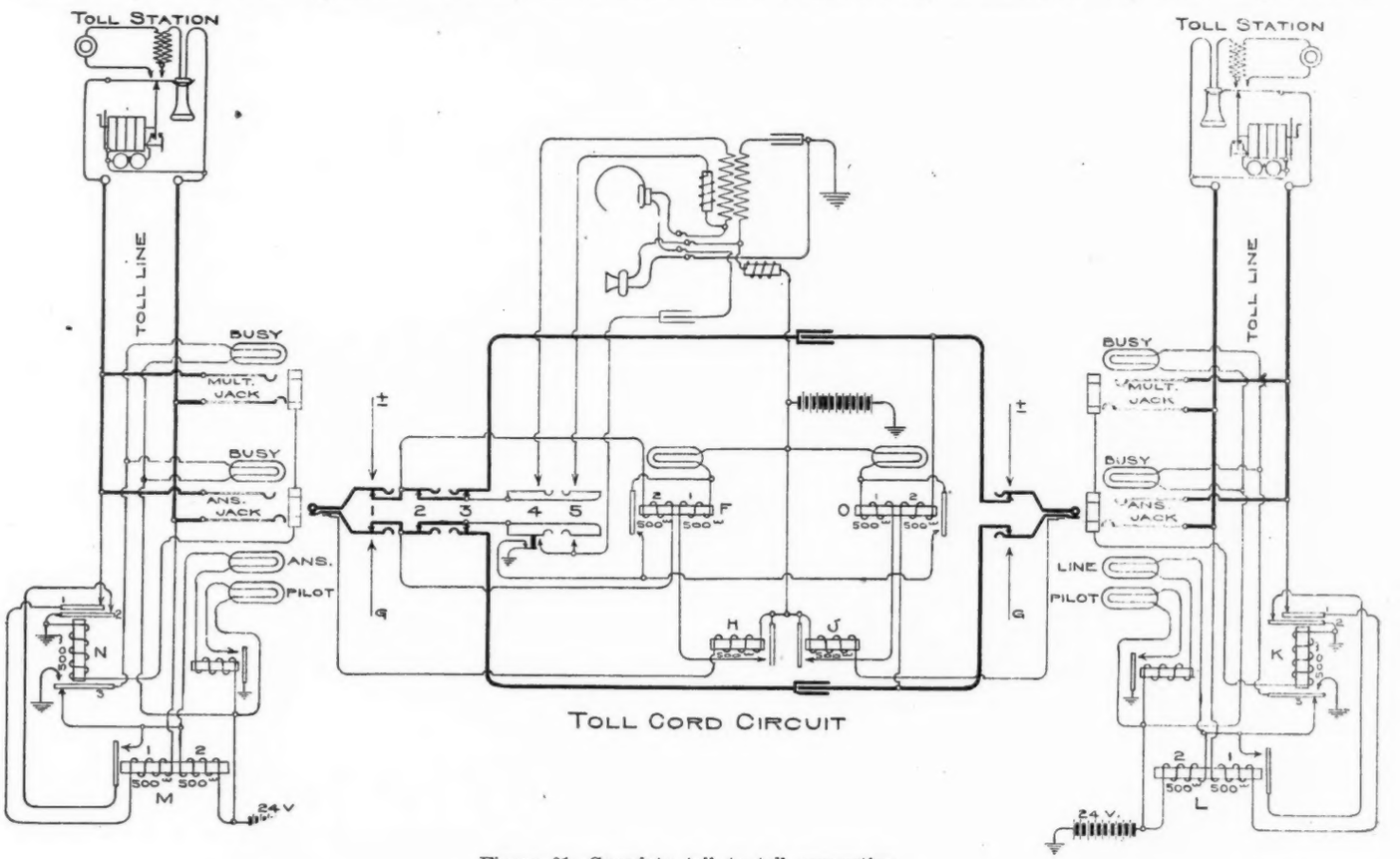


Figure 21—Complete toll to toll connection.

In our description of this equipment it is deemed advisable that a complete toll to toll connection be shown and traced, since the apparatus used for this kind of an equipment is radically different from anything we have explained before. The complete toll to toll connection is shown in Figure 21. It will be noted that the general scheme used in the line circuit is similar to that used in a regular common battery subscriber's line circuit, since we find that the essential and vital features of both circuits are the line and cut-off relays, the former of which, with the signals, is continually legged to the line when the same is idle, and the latter to disassociate the signaling apparatus from the line during a conversation. The method of operation is briefly as follows: A subscriber desiring to call the exchange will actuate his generator, which operation will energize winding No. 1 of relay *M*, thereby causing the attraction of its armature which will complete three circuits which can be traced as follows: From the ground on armature No. 2 of relay *N* by way of the break contact to the armature of relay *M* and hence through the line lamp to battery, thus causing the same to become lighted. Another circuit follows identically the same route to the make contact of relay *M*, but from there it finds its way to battery by way of winding No. 2 of relay *M*. This second circuit is locking in nature, since relay *M* is held in an operated position due to its own actuation until the circuit is broken by the drawing up of armature No. 2 of the cut-off relay *N*. Thus, it is obvious that when a subscriber rings up it will require but one turn of the generator crank to lock the line relay *M* by means of winding No. 2, and consequently give a permanent line signal at the switchboard. The third circuit completed by means of the operation of the line relay is the one containing the busy lamp, whose route is also the same to the make contact of the line relay, outlined above, and from here it may be traced to armature No. 3 of relay *N* and hence through the busy lamps, in parallel, to battery. Thus all the busy signals associated with this particular line will be lighted. It might be well to state that mounted above and associated

with the multiple jacks of each line are busy lamps which will become lighted as soon as a subscriber calls in, or an operator plugs into the jack corresponding to that particular line and these lamps will remain lighted as long as the line is busy. It is, therefore, evident that an operator can see at a glance whether or not a line is busy. Returning to the connection we find that the subscriber has called in, thereby causing the lighting of the line lamp. The operator, observing the displayed signal, will plug into the jack associated with the lamp, operate her listening key (4) and ascertain what is desired. The act of plugging into the jack will close a circuit from the battery connected to the coil of relay *H* by way of the sleeve of the cord and jack through the coil of cut-off relay *N* to ground. Thus these two relays will be energized. The operation of relay *N* performs several functions. In the first place, due to the attraction of armature 1, coil 1 of relay *M* is no longer bridged across the line and consequently cannot cut down transmission; secondly the attraction of armature No. 2 will remove the ground from the completed circuits mentioned above in connection with the attraction of relay *M* and consequently this relay will become unlocked and its armature will fall back therefore the line lamp will be extinguished. The busy lamp will not be extinguished, however, due to the fact that the ground connection robbed by the attraction of armature No. 1 of relay *M* is replaced by the drawing up of armature No. 3 of the same relay.

The operator having actuated her listening key is in a position to converse with the calling subscriber and will consequently ascertain the number of the party desired, and in case she finds this line idle, determined by the condition of the busy lamp, she will plug into the jack of this line with the calling plug of the cord circuit used and ring the party desired. The act of plugging in will complete a circuit, which can be traced along the same general lines as that outlined for the calling subscriber, and will cause the operation of the cut-off relay *K*, in the called subscriber's line, and relay *J*, in the cord circuit. When this subscriber answers the operator will connect him with the calling subscriber by throwing the cam of key No. 3 and at the same time she will operate her calculagraph to time the connection.

When the conversation is completed both parties will "ring off" which will give rise to similar results, at each end of the connection, hence the description of but one circuit is deemed sufficient, therefore we will only trace the circuit from the called subscriber's set. When this party rings off the current will seek the following path: From the tip side of the line to the tip of the cord through winding No. 2 of relay *C* to the sleeve side of the cord and hence back to the sleeve side of the line. Thus relay *O* will be energized and draw up its armature, which action will lock the relay and at the same time light the supervisory lamp and give the operator a disconnect signal. The relay is locked by means

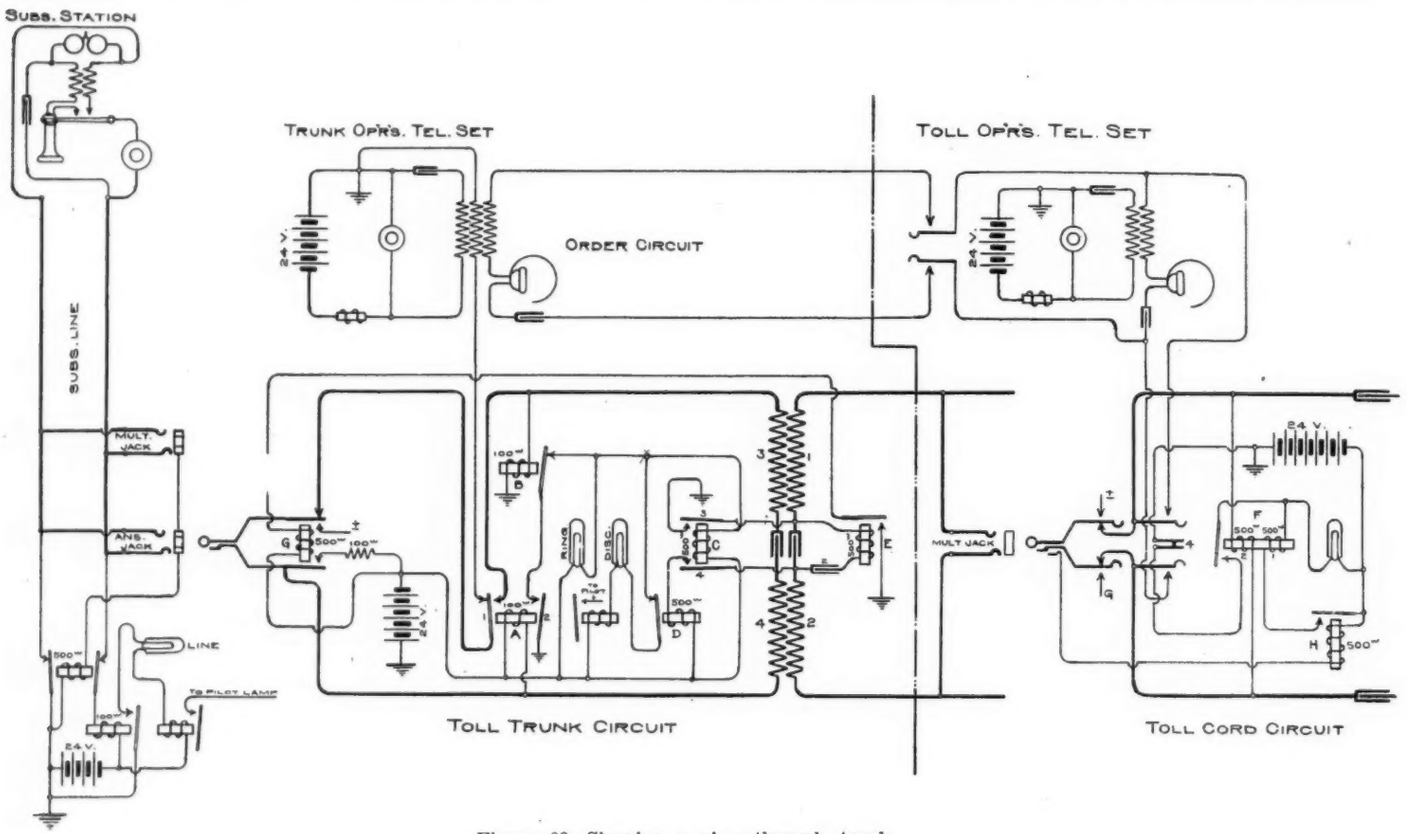


Figure 22—Showing a ring through trunk.

of a circuit that can be traced from the ground on key No. 4 to the armature of relay *O* and hence through winding No. 1 of the same relay to the make contact of relay *J* from where, by means of the armature of this relay, it finds its way to battery, while the lamp is lighted by a circuit starting at the ground on key No. 4 from where it can be followed to the armature of relay *O* and then through the lamp to battery. Thus when both subscribers "ring-off" the operator will obtain a double disconnect signal, thereby indicating that the conversation is finished, and she will consequently remove her connection. The withdrawing of the plugs will open the circuits at both ends of the cord circuit containing the cut-off relays *N* and *K* and the cord relays *H* and *J* and therefore these relays will be de-energized and their armatures will fall back. The releasing of the armatures of the cut-off relays *N* and *K* will cause the busy lamp to become extinguished, while the dropping back of the armatures of relays *J* and *H* will open the circuit-locking relays *O* and *F*, respectively, and consequently these relays will be de-energized. Their armatures will therefore fall

back thereby extinguishing the supervisory lamps. Thus the apparatus is all restored to its normal condition and ready for another connection.

Before leaving this connection we would like to call attention to the fact that the circuits locking relays *F* and *O* both obtain their ground by way of the break contact of the listening key, key No. 4. The reason for this is that the operator may extinguish the supervisory lamp in case the same becomes lighted due to the fact that a subscriber connected to a cord circuit signaled the exchange by the operation of his generator. In explaining this we will devote our attention to the answering end of the cord circuit. A subscriber signaling the exchange will lock relay *F* and thus light the supervisory lamp as has been previously explained. The natural operation of the operator upon seeing this signal would certainly be the actuation of her listening key, key No. 4, to determine what is desired, and she thereby accomplishes the double result, first, of unlocking relay *F*, which in turn will extinguish the supervisory lamp due to the removal of the ground from the circuit by the opening of the make contact of key No. 4; and second, the bridging of her telephone set across the circuit, which will place her in a position to talk to the subscriber. Furthermore, when the operator returns her listening key, key No. 4, to normal, the circuit is again in a condition for supervision. Thus the cord circuit is always in a condition for good service since the operator must "throw" her listening key in order to talk to a subscriber and as she thereby mechanically restores her circuit to a state in which it is ready for further supervision.

TOLL TO LOCAL CONNECTION.

The toll to toll connection being disposed of we will now endeavor to show how the toll to local business is handled with this type of equipment. Before going into a detailed description of this kind of service it might be well to explain that it is deemed advisable that the toll operator has, at all times, complete control of the connection. To meet this condition, a circuit commonly known as a ring-through trunk, has been designed, which is shown in a completed connection in Figure 22. The toll end of these trunk circuits are jack ended and multipled in each section of the toll board, whereas the local end terminates in a cord and plug at the toll trunking position. With this kind of a circuit the toll operator has absolute control, the only operation which the trunking operator performs being the assigning of the trunk and the insertion of the trunk plug into the multiple jack of the local subscriber desired. This will be readily appreciated after the following description has been read.

A toll subscriber having called the exchange in the usual manner will inform the toll operator as to the number of the local subscriber desired, whereupon the toll operator will place herself in communication with the toll trunk operator by means of an order circuit giving her the number of the line called for. The trunk operator will then test the multiple jack of the desired party, and if the same be found idle, she will insert the plug of one of the trunk circuits into the previously mentioned jack, and at the same time inform the toll operator as to the number of the trunk circuit used. The act of plugging into the jack performs several operations which will be taken up in the order in which they take place. Primarily we find that we have a completed circuit from the ground at the cut-off relay in the subscriber's line circuit by way of the sleeve strand of the jack and trunk through the coil of relay *A* to battery. This will cause the energization of the cut-off relay as well as relay *A* and consequently their armatures will be attracted. The drawing up of the armature of relay A will close the tip strand of the trunk and thereby remove the busy test tap, while the attraction of armature No. 2 will complete a circuit which may be traced as follows: From the ground on armature No. 2 by way of the make contact to the armature of relay *B* and hence by means of the break contact of this relay through the ringing lamp to battery, causing the same to be lighted. However, we find that the attraction of armature No. 2 of relay *A* has also completed the following traceable circuit, from the aforesaid armature to the armature of relay *B* and then by way of the break contact of this relay through the coil of relay *C* to battery. This will cause the energization of relay *C* thereby attracting its armatures.

It now behooves us to take into consideration the condition of the toll end of the circuit in order to ascertain the functions of relay *C*. In case the toll trunk operator inserts the plug before the toll operator does, we find that the disconnect lamp at the trunk position will also be lighted by means of the following circuit. Returning to relay *A* we can trace a circuit from the ground on armature No. 2 to the armature of relay *B* and then by way of the break contact of this relay to the break contact of relay *D* and hence by way of the armature and disconnect lamp to battery. However, in case the toll operator has previously inserted the plug of one of her regular cords into the trunk jack, or at any time that she does so, we find that the conditions are very materially changed. Thus we find that a circuit has been completed from the ground on armature No. 3 of relay *C* by way of the winding No. 1 of the repeating coil and the tip strand, of the trunk and cord of the toll cord circuit, through winding No. 2 of relay *D* and hence by way of the sleeve strand of the cord and trunk circuit, through winding No. 2 of the repeating coil to armature No. 4 of relay *C* and then by way of the make contact of this relay through relay *F* to battery. The completion of the circuit just outlined will cause the energization of relays *D* and *F* which will consequently give rise to the following results: The attraction of the armature associated with relay *F* will light the lamp in the toll cord circuit, thereby giving this operator supervision, and the energization of relay *D* will cause its armature to be drawn up which will open the circuit containing the disconnect lamp which will consequently be extinguished. This will inform the trunk operator that the toll end of the connection has been properly completed. From the foregoing it is clear that in case the toll operator completes her end of the connection prior to the trunk operator, the ringing lamp will be the only one to light in the trunk circuit, but if the connections are put up in the reverse order both the ringing and disconnect lamps in the trunk circuit will light, the latter being extinguished when the toll operator completes her end of the connection. We have now traced the connection to the place where we are ready to ring the local subscriber, which part of the operation is performed by the toll operator by means of a very ingenious device which is accomplished by one of the fundamental theories of alternating currents which we consider best to review before we show its adoption to this circuit.

The law taken advantage of is, that in a circuit in which an alternating current is flowing, the capacity and induction may be so balanced as to render the same non-inductive to a current of that particular frequency. A circuit in which this condition of affairs exists is called a resonant circuit and the condition is established when the capacity and induction are so balanced that $2\pi fL = \frac{1}{2\pi fC}$ or $L = \frac{1}{C}$ in which L represents the inductance, f the frequency and C the capacity of the circuit. Consequently if we have any two of the above quantities given we can so design the third as to render the circuit non-inductive to the alternating current used. Thus if the capacity and inductance are fixed the frequency of our alternating current must be $f = \frac{1}{2\pi\sqrt{LC}}$ which is termed the critical frequency for resonance.

Now, if we return to our circuit we will notice that condenser No. 1 is shunted by a circuit containing condenser No. 2 and the coil of relay *E*, in which the capacity and inductance are so balanced as to render it resonant, and consequently, if the toll operator were to actuate her ringing key the alternating current would follow the path of least impedance and would therefore naturally choose the above mentioned circuit. For this reason relay *E* which is so designed as to be a slow acting alternating current relay would become operated. The particular feature in the design of relay *E* is that its armature is very heavy, and consequently its inertia is such as to prevent it from falling back at the time of the reversal of the current, or in other words at the time when the curve of the current is at its zero value.

From the above it will be noted that whenever the toll operator actuates her ringing key she will energize relay *E* which will complete a circuit that may be traced from the ground on the make contact of this relay by way of its armature to the coil of relay *G* and hence to battery. Therefore relay *G* will be energized and attract its armatures, which operation will be equivalent to actuating a ringing key at the trunk position since, we find that on the make contacts of relay *G* we have the regular ringing current usually carried to an ordinary ringing key and as the attraction of armature No. 1 of relay *G* also cuts off the switchboard end of the trunk circuit there is no possibility of ringing back into the signaling apparatus. In case the local switchboard is equipped with selective ringing for party line service each trunk circuit is provided with a master key, and in this case the trunk operator depresses the key corresponding to the particular kind of current required for ringing the local subscriber desired at the time she puts up her end of the connection. In this case the make contacts of relay *G* are wired to the particular current used for ringing single line parties and the operation of the master key cuts off this current, and substitutes in its place the current needed for party line ringing. Consequently the trunk operator is called upon to help in the operation of ringing only when a party line subscriber is desired, and even in that case the operation consists in merely depressing a master key the toll operator attending to the rest.

It will be noted from the above that the toll operator can ring the local subscriber at will, and as she is usually in a position to devote her entire time and attention to one or two connections she will ring the local subscriber oftener, in case he is slow in answering, than the trunk operator who usually has all she can handle in putting up connections. For this reason unnecessary delay, due to the fact that the local subscriber is not rung frequently enough, will be avoided and consequently the tying up of toll lines which would be very detrimental.

We have thus far traced the connection to the ringing of the local subscriber. When this subscriber answers we find that relay *B* in the trunk circuit will be energized due to the completion of the following circuit, from the ground on the coil of relay *B* through the make contact and armature No. 1 of relay *A* to the tip of the cord and plug and hence by way of the tip strand of the line circuit through the subscriber's set to the armature of the cut-off relay, which has been operated as previously explained, to the make contact of the cut-off relay and hence to battery.

The drawing up of the armature of relay *B* performs several functions which we will take up one at a time. In the first place it robs the circuit containing the ringing lamp of its ground connection thereby extinguishing this lamp which will inform the trunk operator that the local party has answered, and secondly it will remove the ground from the circuit which has been previously traced containing relay *C*; and therefore this relay will become de-energized, thereby causing its armatures to fall back. The dropping back of these armatures, will, in the first place open the circuit that has been previously traced through the toll cord circuit and thus relay *F* in the cord circuit will be de-energized thereby extinguishing the supervisory lamp which will inform the toll operator that her party has answered, and secondly it will cause the de-energization of relay *D*, which will allow its armature to fall back. The toll operator will now operate her calculagraph and allow the parties to converse.

When the conversation is complete the local subscriber will hang up his receiver and the toll subscriber will "ring off." The latter operation will light the supervisory lamp in the toll cord circuit in the regular manner as explained in our description of the toll to toll connection. The "hanging up" of the local subscriber, however, will again de-energize relay *B* in the trunk circuit which will cause its armature to fall back and thus again furnish the ground for the circuit containing the ringing lamp and the one containing relay *C*. Therefore the ringing lamp will again light and relay *C* will be energized. The energization of relay *C* will again complete the circuit through relay *F* in the toll cord circuit and thus the second supervisory lamp in this circuit will be lighted. However, the disconnect lamp in the trunk circuit will not light since the circuit that energized relay *F* also contains relay *D*, which will therefore be actuated and open the disconnect lamp circuit. But when the toll operator receives the disconnect signals mentioned she will remove her connections. This will open the circuit through relay *C* thereby de-energizing the same, which in turn will de-energize relay *D*. Thus the armature of relay *D* will drop back and close the disconnect lamp circuit in the trunk circuit and this lamp will once more be lighted. The trunk operator now has a disconnect signal from both ends of the circuit and she will therefore take down her connections which will release relay *A* and thereby restore the apparatus to its normal condition.

LOCAL AND TOLL CONNECTIONS.

Since with this class of service the recording system is adopted and as the circuits used are similar to those described for recording work with the multiple magneto toll board, we will refer the reader to Article No. 4 of this series, in case he desires to review the same. It is understood, of course, that after the call is recorded and the toll subscriber has been reached the method of operation just outlined for a toll to local connection is used.

CORN BELT COMPANY PROSPERS.

At a special meeting of the stockholders of the Corn Belt (Independent) Telephone Company of Waterloo, Ia., it was voted to increase the capital stock from $300,000 to $500,000 to provide for the tremendous growth of the business. The company has been in operation twenty-six months. During that time its subscribers' list has grown from 2,500 to 6,694, an actual gain of 4,194 telephones, or 167 per cent increase. A copper circuit for long distance service has recently been completed, connecting Waterloo with St. Louis, Mo., Elgin, Aurora, Springfield and other cities in Illinois. The growth of the business of the company under the present management is little short of phenomenal. When the Corn Belt people took hold of the business the service was poor and the lines and exchanges were in a state of decadence, but under the able management of A. T. Averill, the president, S. S. Lichty, the secretary, and J. M. Shoemaker, the general manager, the company has made great strides in advance.

Operator—"Have they answered?"

Subscriber—"Oh, yes, they've sent for Maggie Ryan. She lives on the top floor. You know we can't keep the Irish down."

INTERNATIONAL BULLETIN No. 5

Important Announcement Regarding the 1908 Convention and Plans of the International Independent Telephone Association

By Theodore Gary

CHICAGO HEADQUARTERS.

ARRANGEMENTS have been made to remove the association headquarters to the Monadnock building, Chicago, November 1st. The transfer will be completed not later than November 10th, after which date correspondence should be sent to the new address.

THE 1908 CONVENTION.

January 21, 22 and 23, have been selected as the dates of the next annual meeting, which will be held at the Coliseum in Chicago, in connection with the Electrical Show, the event of the year for the electrical industries. Exceptionally fine exhibits are being planned by the various telephone manufacturers and supply dealers, and in addition to these, all attending the convention will have an opportunity to view the splendid exhibits made by manufacturers of kindred lines of electrical apparatus, so that the exhibits alone will be a feature the up-to-date telephone man can hardly afford to miss. As the time selected is the most convenient possible for the majority of telephone men, the attendance promises to exceed that of last June, which broke all previous records.

There are many important matters to be considered at the January meeting and no efforts will be spared to arrange a program that will be extremely interesting and helpful. Due attention will also be given to providing suitable entertainment. We want to make this convention an unqualified success in every way, and ask the hearty co-operation of all interested to that end. Do *your* part. Start now to boom the 1908 convention.

CONVENTION DELEGATES.

State and provincial associations should arrange to select their delegates and alternates to the convention as soon as possible, to avoid delay in preparing proper credentials. Blanks for reporting representatives selected may be obtained from the general office.

SUGGESTIONS DESIRED.

With a view to making the convention thoroughly representative, every one in the field is invited to send in suggestions for papers, discussions or special features, and officers of the various associations are requested to submit the names of their members who would make suitable timber for the various committees. Gentlemen, this is your convention; let us know your wishes.

MAKE RESERVATIONS EARLY.

Manufacturers and others desiring to exhibit at the Electrical Show during the convention will do well to give the matter early attention. Make all arrangements with Homer E. Niesz, manager, Electrical Trades Exposition Company, 464 Monadnock building, Chicago.

ASSESSMENTS.

Some associations have not yet paid anything on installments due on assessments. Remittance should be made promptly. Delay seriously hampers effective work being done.

PUBLICITY.

The establishment of this department is held up on account of finances, and until a man has been selected for handling publicity, the president will endeavor to carry on a certain amount of the work. All in the field are urged to give this department the assistance necessary to its success by responding promptly when called upon to furnish information for its use. If the publicity department can help you, remember, it is at your service.

MEETINGS.

Commendable activity is being displayed by quite a number of the state associations in arranging district meetings. Other states should give this matter immediate attention. It is very important; the progress of any association depends in a large measure upon the success of district meetings. A number of states have already decided the dates for their next annual meetings. Others should do so without delay, and, whenever possible, arrange to hold these meetings before the International convention. The association will endeavor to have a representative at all state meetings.

PROPER ACCOUNTING.

Every Independent telephone company should earn and pay dividends. If your company does not, there is something wrong. Find the leaks and stop them. Proper accounting will show you where and what they are. If your system of accounting needs revision, better give it attention now. Copy of standard forms may be obtained free from the Cleveland office.

DISCONTINUANCE SALE.

All stock of the supply department has been practically sold out, with the exception of a number of colonial lanterns, some large transparencies and a few cuts of various sizes. Prices, which are just about factory cost, have been placed on these to move them quickly. If you are not supplied, better take advantage of this opportunity while it lasts.

GRASS LAKE (MICH.) SOUVENIR.

The Farmers' Telephone Company of Grass Lake, Michigan, sends out an attractive souvenir in the shape of a postal card showing a photograph of one of its buildings. This

Independent company is meeting with well-deserved success and is having a most prosperous year.

The stone building, shown in the accompanying illustration, is nearly covered with vines and flowering creepers that add greatly to its attractive appearance.

A SPECIAL WORD TO SUBSCRIBERS

In requesting change of address, always give the name of the post office to which your magazine is sent. Your name cannot be found on our books unless this is done. TELEPHONY is not returnable from the newsdealer. If you desire to purchase the paper from a dealer it will be to your advantage to notify him that you will want it, in order to insure his having a copy for you. If you wish to receive the paper regularly, please send in your subscription so that we can mail it to you direct.

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EDITORIAL DEPARTMENT

THE INTERNATIONAL CONVENTION.

THE 1908 convention of the International Independent Telephone Association will be held at the Coliseum, Chicago, January 21, 22 and 23. Already the signs indicate that the coming meeting will be a great success. At the same time, and in the same great building, the annual exhibition of the Electrical Trades Exposition Company will be occurring, and the combination of these two important events is sure to guarantee the success of both. The sessions of the International convention will be held in the Coliseum Annex, where there will be extensive exhibits by many telephone manufacturers and supply dealers, and visitors will be able to take advantage of an opportunity to attend both events without leaving the building.

President Gary, Secretary West and Assistant Secretary Harney of the International association are preparing to make the coming convention a notable affair, and should have the hearty co-operation of Independent telephone men all over the United States and Canada in their efforts to boost the 1908 meeting.

The Electrical Show begins January 13 and continues two weeks. The two previous exhibitions given in 1906 and 1907 were brilliant successes, and the meeting of the International association goes far to insure its keeping up that record next January.

The show has come to be one of the great expositions of the country. Many telephone men have attended it in other years, and found it a benefit, as the show presents in a concrete form all that has been done and is being done in the electrical field. All Independent telephone men should plan to be in Chicago January 21, 22 and 23.

A CANADIAN RE-INFORCEMENT.

UNDER the caption "'Telephone Age' Also," in its October issue, the Telephone Age, the Independent telephone journal of Canada, printed the following editorial:

"TELEPHONY for September contains the following pointed reference to the Kellogg Switchboard and Supply Company and its attitude towards that Bell corporation:

"'Of all the journals and publications which claim to represent the Independent telephone movement and aid in its success, TELEPHONY is now the only one which does not accept advertising from the Kellogg Switchboard and Supply Company. The reason why this publication does not accept such advertisements is well known. Briefly stated, that reason is because TELEPHONY does not believe it either consistent in theory or genuine square-dealing in practice to condemn the Bell telephone monopoly in its reading pages and throw open its advertising section to a manufacturing company which is owned and controlled by the Bell, as is the Kellogg concern. In other words, TELEPHONY does not believe it fair to either side—Independent or Bell—to sell its advertising space to a buyer who could, with perfect propriety, use that advertising space to combat the very sentiments and policy advocated in the editorial pages.'"

Commenting upon the above quotation from TELEPHONY, the Canadian journal then says:

"In the sentiments so well and tersely expressed in the latter part of the above paragraph, the 'Telephone Age' fully concurs, but with the statement made in the first four lines it takes issue. It is not true to say that TELEPHONY is the *only* journal representing the Independent telephone movement which does not accept Kellogg advertising, for the 'Telephone Age' is in exactly the same position. From the very start it has refused the patronage of that concern for just the same reason that TELEPHONY refuses it, namely, because it is inconsistent with the aims it had in view when it was established. The 'Telephone Age' believes it cannot rightly take money for the purpose of boosting a company whose every success would be, by just so much, an injury to the Independent cause. And it believes, when both the International and the Canadian associations find cause to condemn Independent dealings with a Bell concern that the organ of the Independent telephone interests should refrain from having such dealings also.

"In stating that it was the only journal to continue to adopt this course, no doubt our contemporary was confining itself to journals published in the United States and omitted reference to the 'Telephone Age' inadvertently."

TELEPHONY is happy to congratulate its Canadian con-

TABLE OF CONTENTS

William B. Woodbury.....Frontispiece 261
Detroit Telephone System.....J. P. Boylan 262-269
Independent Telephone Publicity.....Theodore Gary 270-272
Selection of Exchange Equipment.....H. P. Clausen 273-275
Concerning the Kellogg..... 276-277
Digest of Telephone Patents.....E. E. Clement 278-279
Review of Telephone Development.....S. G. McMeen 280-282
Kansas City Long Distance Company.....C. D. Wright 283-284
Features of the Electrical Show.....A. D. Blocker 284-285
The Pennsylvania Convention.....A. B. Turner 286-288
Modern Toll Switchboard Equipment.....J. E. Hilbish, J. B. Thies and G. A. Joy 289-292
International Bulletin No. 5.....Theodore Gary 293
Editorial Department.....H. B. McMeal and H. D. Fargo 294-299
Questions and Answers.....H. P. Clausen 300-304
Modern System at Decatur, Illinois.....D. R. Craig 305-306
Decisions Affecting Telephony.....G. W. Hand 306-308
Manufacturers' Department.....W. H. Graffis 310-320
New York Convention.....J. H. Olliver 321
Telephone News from Abroad.....J. W. Bruer 322-323
In the Rural Districts.....O. H. Brandenburg 324

temporary both on its judgment and on its analysis of this publication's motives, for, first, we believe the "Telephone Age" is wise in refusing to accept Kellogg advertising while that concern remains a Bell-controlled concern, and, secondly, we know that our contemporary is equally right in taking it for granted that TELEPHONY had in mind only the telephone journals published in the United States when it called attention to the fact that no other telephone journal is refusing the Kellogg patronage.

TELEPHONY is gratified to hear that its course is commended by the organ of the Canadian Independent telephone interests, and especially that it should be commended in so practical a manner, namely, the adoption of and adherence to the same position. We believe the Independent movement at large indorses this stand on the part of the "Telephone Age" and TELEPHONY, for after all fair play wins in the long run.

A WORD ABOUT $1,000 BLUFFS.

IN its issue of October 5, page 32, our weekly contemporary, which has been boasting about its circulation, declared that it would make the International Independent Telephone Association a present of $1,000 in cash if TELEPHONY submitted its postoffice receipts for August to the president of the Telephone Manufacturers' Association. Our contemporary did not specifically refer to TELEPHONY by name, but everybody knows that TELEPHONY was meant, just as everybody knows whom we allude to when we speak of "our weekly contemporary which has been boasting about its circulation."

TELEPHONY having submitted its August postoffice receipts to the president of the Telephone Manufacturers' Association, it is now up to the aforesaid weekly—if its words mean anything—to forward its check for $1,000 to the International Independent Telephone Association. It has not done so up to date, and, while we are no pessimists, we regret to predict that it never will. As a friend of the association, TELEPHONY has certainly done its share to direct $1,000 in cash into its treasury. The association could use that money to good advantage, but the chances are all against its ever getting such an amount from that source.

Needless to state, our contemporary thought it was putting TELEPHONY in what is commonly known as "a hole," by demanding the filing of the August postoffice receipts. Its reason for this belief was this: The Telephone Manufacturers' Association had asked all the telephone journals for their circulation figures. Some complied; others did not. TELEPHONY belongs to the former class. Naturally supposing that the latest figures were those required TELEPHONY first filed its September receipts, the September issue—of which more than 10,000 copies were printed and circulated—being just off the press. Because we gave the September figures instead of the August figures, our contemporary jumped to the conclusion that TELEPHONY was afraid to give its August circulation. So thoroughly imbued with that idea did our contemporary become that it was tempted to dash into print with its $1,000 bluff offer.

In doing this, our bluffing contemporary had two theories: First, if TELEPHONY did not file its August receipts the maker of the $1,000 bluff was safe anyway and could gleefully claim that he had backed TELEPHONY into a corner and himself got away without a scratch. Second, if TELEPHONY did file its postoffice receipts for August the bluff-maker hoped that he might derive some satisfaction from the poor showing he expected they would make because they were not filed before—and always he figured on side-stepping the putting up of the $1,000.

"Money talks," cried this bold maker of the $1,000 bluff. So it does, but bluffers howl. In one of the so-called "great American games"—not baseball, however—the player who bluffs with a $1,000 bet and is not "called," is entitled to rake in the stakes, and possibly win the reputation of being a bold, skillful player. But when another player "calls" that bluff, and nothing but a pair of deuces or a bob-tailed flush or a "busted" straight is found behind the $1,000 bet, what happens? The bluffer loses his $1,000 unless he is permitted to run to cover with his thousand, explaining that he was "only fooling." This seems to be the case in the present instance, for the weekly's $1,000 bluff has been called by TELEPHONY, and still the "thousand in cash" has not been paid to the International Association.

TELEPHONY makes no bluffs; it deals in facts and submits the following: It furnished its postoffice receipts for the issue of August, as asked for by the Telephone Manufacturers' Association. These receipts totaled over 7,500 pounds. Our weekly contemporary submitted its postoffice receipts for the issue of August 12, the issue asked for, which totaled less than 1,700 pounds. The difference of nearly 6,000 pounds (three tons) gives you the *real* facts. The conclusive proof of TELEPHONY's supremacy is shown by the postoffice receipts furnished the Manufacturers' Association by three of our contemporaries (and a statement by a fourth) which total about 5,000 pounds, as against TELEPHONY's more than 7,500 pounds, or a difference in favor of TELEPHONY of 2,500 pounds—fifty per cent *more* than all our contemporaries *combined*. Further comment seems unnecessary.

PRESIDENT VAIL'S ADMISSION.

INDIRECTLY, though none the less significantly, Theodore N. Vail, the new president of the Bell telephone combine, admits the advisability of that aggregation of corporations getting on better terms with the public. In his official announcement of the Western Electric Company's plan to sell Bell telephone apparatus in the open market, President Vail alludes to the "great advantage" which the Bell hopes to derive "from improved relations between the public and all the associated Bell companies." The head of the combine then proceeds to elaborate on the theory that the public has erroneously entertained certain ideas that the high Bell rates in most cases are due to the royalties charged for use of Bell instruments, and argues that the Western Electric's new policy will tend to overthrow this notion.

It is something to know that the Bell bosses admit even to themselves that there is a possibility of improving the "relations between the public and the associated Bell companies." The arrogant spirit which the monopoly has uniformly manifested in its dealing with the people, of course, could not help but foster a strong feeling of resentment in the public breast, but never before have the Bell magnates deigned to recognize it and refer (publicly, at least) to the wisdom of improving the relations existing between the furnisher and user of telephone service.

It is noticeable that the Bell does not admit that the presence of Independent telephone companies in the field has much to do with compelling it to seek more cordial and amicable relations with the people, but that, after all, is really why the combine finally confesses an improvement is desirable. The people, however, are becoming wise to this fact, for hundreds of cases prove that only when Independent competition threatens does the Bell show the slightest wish to cultivate public sentiment. It's the old story of "When the devil was sick the devil a monk would be."

FUTURE OUTLOOK IS PROMISING.

THE telephone man who is not a downright pessimist can hardly take otherwise than a hopeful view of the future. Plans for telephone work in many cases were suspended during the past season, it is true, but this makes it all the more likely that the coming year will witness their execution. It is scarcely probable that operations as

urgent as telephone improvements usually are can be held up for two consecutive seasons. Copper, whose high price proved one of the chief deterrents this year, is finally down to a reasonable basis and seems likely to remain there or go still lower.

Glancing over the copper tables for the past fifteen years we find that this metal sold as low as 10¾c in 1892 and at 9¾c in 1893. The year following, it dropped as low as 9⅛c and continued to range from 9c to 12c for the next four years. In 1899 it was jumped to 18c by the copper pool, which gave the public one of its first bitter tastes of trust-created, fictitious valuations. The same greedy interests have held the buyers' noses to the grindstone ever since until they finally overreached themselves a couple of months ago and the present pleasing collapse occurred. If there is any sorrow in the telephone field over the fate of the now celebrated copper corner we have yet to hear of it.

Added to the assurance of cheaper wire for next year's building is the fact that crops have been generally good this season and nearly all of the central and western states are in a highly prosperous condition. The downfall of speculators and adventurers in Wall street, New York, will have no effect whatever upon the remainder of the United States which bases its finances upon something tangible, in the shape of crops, live stock, land and manufactures. Chicago, which is one of the chief commercial centers of this great zone of industry, is also the center of the greatest telephone territory in the world, and Chicago reports plenty of money for every honest enterprise.

With this sentiment existing in western financial circles, and every other condition favorable, we believe it highly probable that legitimate telephone enterprises will fare well in 1908.

THE SITUATION IN CHICAGO.

LITTLE progress has been made during the past month in the telephone fight in Chicago. The local Bell licensee has not made much effort to advance its ordinance which is before the city council, and so long as it remains stalled on a sidetrack nobody else seems at all anxious to have any action taken. At the first move to push the franchise extension through, however, there is likely to be enough agitation to suit anybody—and the Bell particularly, which probably will think there is too much stir altogether. The impression prevails that the Chicago company is merely waiting a favorable time to press its ordinance for passage through the council. In fact, it had its plans all made to bring the measure up when the grand jury, which was probing into gambling and graft charges, discovered signs that the Chicago Bell knew considerable about gambling in the city, and subpœnaed a number of the telephone men. Naturally, the pilots of the telephone ordinance made up their minds it was not an opportune time to ask any favors from the city and the ordinance was allowed to sleep undisturbed through several council meeting nights.

As soon as the signs are more propitious, of course, the Chicago Bell will renew its fight for a franchise, for it must have an extension or go out of business. And it doesn't want to go out of business, needless to say, for the pickings in Chicago are too rich and juicy. The revelations showing what a harvest the company has reaped in Chicago for years even indicate that the Bell would be willing to make many more concessions to obtain a franchise than are granted in the pending ordinance. That the people are aware of this fact—and also of the fact that more concessions are due them—is very plain, and further changes may be demanded in the ordinance. The trouble is the Bell is waiting for the psychological moment in which to push its bill, and that, judging from the way the telephone trust is being hammered all over the country, there is no certainty when the path will be clear. Meanwhile it behooves the people to be on the alert, and not let their aldermen fall under the influence of the franchise-seeking corporation too completely. As it is, the indications are plain that some of the men in the city council will find their careers cut short because of their too obvious willingness to favor the Bell.

CO-OPERATION WANTED.

WE have been improving TELEPHONY for seven years, since its first number, and are not yet satisfied with it. It may be we are too close to get the right perspective, or too analytical, or trying to cover too wide a range. To us the publication seems not sufficiently comprehensive or complete. To make it so we are going to appeal to our readers, and will appreciate frank advice. We appeal especially to the one reading this editorial:

What feature of TELEPHONY do *you* like most?

What feature do you like least?

Is our Question and Answer department helpful?

Is our Legal Decision department of value to *you?*

Do you read the Patent Digest and is it interesting?

Do we devote too much or too little space in covering conventions?

Do you read and enjoy the convention papers which we publish?

Is too much space being devoted to our Manufacturing department?

Is the Rural Line page interesting?

Did you read any of the "Stories of the States," and did you like them?

Is there any department you would like to have appear regularly?

Is there any department you consider unnecessary?

Do you like the arrangement of the advertising pages?

Is there anything lacking in the advertisements which you would suggest being added?

How do you like the editorial pages, and the editorial policy of TELEPHONY?

Do we publish too much or too little technical matter?

What general suggestions have you to offer?

We feel that through the co-operation of our readers, we can make this publication more valuable and to this end will appreciate each of our subscribers writing his candid opinion and making suggestions. We are earnest in our desire to make TELEPHONY more interesting to telephone men and will appreciate the practical suggestions from those who have made Independent telephony the greatest industrial movement of the age.

THE WEST AND THE EAST.

INDEPENDENT telephone securities were not injuriously affected by the squalls that clouded New York's financial skies during recent weeks. In fact, that portion of the country still referred to as the west participated little in the flurry that threw a big scare into many of the eastern interests. So far as the immunity of Independent telephone movement is concerned the reason is not far to seek, for the success and prosperity of Independent telephone companies depend almost altogether on local business men and the stock depression in Wall street seems to be confined to that speculative neighborhood, as the great producing section of the United States is building and growing as strongly as ever.

Chicago and the west, in fact, have manifested no alarm over the monetary difficulties in New York, largely because they stand on their own feet and need to ask no favors from the east. The time was, of course, when the reverse was true. The west owed New York money, and whenever times tightened up in the east the screws were

immediately felt in the west. Today the west is not pouring a stream of interest money into New York, and Wall street cannot apply the old pressure on western business enterprises when—as now—the stock manipulators become involved in difficulties. The people of the west are too busy with their crops, their mines and their factories to bother about stock gambling. While they may feel sorry for Wall street, they do not feel compelled to pinch themselves in order to relieve the stringency there as they used to do.

"No part of the west need be alarmed," says James B. Forgan, president of the First National Bank, of Chicago. "Out here we do a banking business different from that carried on in New York. Our loans are made on the products of the farm and factory. Crops were never better. Chicago's banks were never sounder."

John J. Mitchell, president of the Illinois Trust and Savings Bank, the largest state bank in Chicago, says: "Our banks—every one of them—are as safe as they were at any period of Chicago's history. We haven't felt the disturbances that have gone on in the east. Nor will we."

The reason for this security is that the collateral of western banks is not stocks which are likely to shrink—as most water-fed products do—on short notice. The collateral of western banks represents, instead, real, genuine commodities like grain and cattle. The sale of crops, the marketing of cattle and the distribution of manufactured goods bring more money to the west, where the actual goods are delivered. This is why the shuttle-like action of stock certificates do not affect the west as it does the east.

But after all the country as a whole will continue to prosper, and even Wall street will profit eventually by the wiping out of unsound financing. As one writer puts it: "But even in the narrow street of finance conditions should not cripple more than temporarily. The vast majority of New York institutions are sound. Wall street has been afflicted with a run of skyrocket banking. But the purging process is nearly over. Conservative, wise men are at the helm. They have the situation well in hand. Skyrocket banks must fail, whether times be good or bad. The rocket which goes up with a scream and a burst of light must come down. Now that the housecleaning is over it is to be hoped that the lesson will leave a lasting impress on Wall street."

As to the unlikelihood of a period of financial depression exercising much effect on the telephone business, several reasons for holding this position are given by H. D. Critchfield, president of the Milwaukee Independent Telephone Company, which are worthy of digestion. Mr. Critchfield says:

"To my mind telephone securities are among the most staple before the public today. The telephone is the last thing a subscriber will discard. He can curtail and cut down his expenses in many other lines. For instance, he may cut off the heating and lighting of some of the rooms in his house; he may cut down his living expenses; he may do away with the services of a clerk or two; he may in short, find means to recoup himself against loss in various ways; but when it comes to the telephone it means either keeping the instrument or cutting it off entirely; and a business man will think many times before he takes so drastic a step where the telephone has come to be a part of his business. All this works together toward making telephone securities highly desirable, particularly when the company has been financed with care and with regard to the best interests of the investing public.

"Independent securities are widely distributed. With few exceptions such companies were and are being financed by people in the community where the companies operate. Bell securities are financed by the same interests that have financed the big railroad and industrial mergers. It is perfectly clear under these conditions why Bell securities have suffered in sympathy with railroad stocks while Independent companies have been lightly touched. There is no tendency on the part of the Independents to throw their stocks and bonds on the market as these are not affected by Wall street."

All of which sounds and is reasonable and logical.

A VICTORY AT NEW HAVEN, IND.

NOT long ago the Bell press bureau issued a list of towns and cities in the United States where Independent telephone companies had failed. In that list was included New Haven, Indiana, which the Bell literature pictured as a place where the Independents had been defeated. October 12, 1907, the Bell closed its exchange in New Haven, packed its traps and left the field to the Home Telephone and Telegraph Company, an Independent concern which has had the Bell on the run for the last two years. Seeing that there was no hope of winning, the octopus sold out and decamped, and now the Independents are in sole possession.

All of which is gratifying to Independents and shows, also, how little reliance can be placed in the list of "Independent failures," periodically sent out by the Bell combination. W. E. Bowers, manager of the Independent exchange at New Haven, deserves the credit for this notable victory. Three years ago he was running a newspaper in the town, and there was much complaint about the local telephone rates. He fought the Bell successfully, and after securing an equitable adjustment of rates the Home Company urged him to manage its exchange. Mr. Bowers had never had any experience in the telephone business, but accepted the place August 1, 1905, and just two years later to the day he closed the deal whereby the Bell sold out and quit the field, the papers in the transaction being completed October 12. Recently Mr. Bowers has received letters from Independent telephone men in various parts of the country asking him the real cause of the "Independent failure" at New Haven, the inquirers having been misled by the Bell press bureau's false reports. In response to these letters Mr. Bowers now simply sends the writers copies of the papers stating that the Bell has acknowledged defeat and retired, leaving New Haven in the sole possession of the Independent company.

COURTESY TO SUBSCRIBERS.

REFERENCE was made recently in these columns to the importance of corporations which deal in public utilities catering to public sentiment and, as far as possible, winning public favor. In no other way can this be accomplished more surely than by the employes of such a corporation—telephone, gas, electric light or railway company—showing a uniform courtesy to persons with whom they come in contact in a business way. This, of course, has often been said before, but it cannot be repeated too often or emphasized too much.

Realizing the importance of courtesy to the general public a big eastern railway company lately issued a circular to its employes, in which, among other things, it said:

"The good will and friendship of the community served by this railroad is the most valuable asset it can have, and the strongest recommendation for promotion an employe in any department can possibly have is the fact that by uniform courtesy and kind accommodation of patrons he has secured for himself and for the road the good will and the friendship of the communities in which he is located."

Perhaps no public utility corporation employe has more to contend with—more frequent justification to lose his or her temper—than has the employe of a telephone company. Particularly is this true of the operators who are often obliged to receive the criticism of subscribers not sufficiently

familiar with conditions to know just what is at fault. Nine times out of ten, of course, this blame falls on the girl at "central." It requires a Job-like patience to remain polite and cheerful under such conditions, but it always pays to do so. If there is a specially fine crown or particularly tuneful harp in the next world for the patient on earth they will certainly be reserved for many telephone operators. Meanwhile, the latter can derive comfort here and now from the consciousness that this attribute is a valuable asset of their employers on earth, for it pays to be polite.

WHAT COMPETITION DOES.

"THE value of the Independent telephone company in regulating the rates of the Bell company has been demonstrated in many cities, until it has become recognized as a factor in the telephone business," says the Rochester (N. Y.) Herald. "The good will of the public has always been manifested toward the Independent companies, and that probably is to-day their most valuable asset."

The inspiration of these remarks is the fact that the Bell has raised its rates in Syracuse, N. Y., while the local Independent company adheres to its old schedule of charges. Naturally, this state of affairs has increased the popularity of the Independent concern and given the people a new insight into the rapacity of the Bell combine. It also throws additional light on the advantage of having two telephone companies operating in the city. Having no other telephone company to fall back upon and being at the mercy of the Bell, the people of Syracuse would have had to accept whatever that generous corporation might have offered. With a competing company in the field, however, the public has an alternative which no doubt will be duly appreciated. The question of what is a fair, equitable rate in Syracuse wholly aside, the situation in that city again demonstrates the value of competition. It is the old proposition of "Pay your money and take your choice." Under the old Bell regime it was "Pay your money whether you choose or not."

CONCERNING GOOD TIMES.

WHETHER unfounded or not, there is much mental speculation in the business world just now about continued prosperity. At the risk of making a joke of a serious matter we might say that there is more speculation on this question than there is on stocks in Wall street. Many wise observers incline to the belief that this very subsidence of speculation in Wall street is largely responsible for the anxiety that the period of good times the United States has enjoyed for the last ten years may be drawing near an unwelcome interruption. The fact that stocks are down in Wall street and that the brokers in that vicinity have become lonesome for the "investing public"—which is fighting shy of the Wall street game—is hardly sufficient to make hard times all over the country, but no doubt Wall street notices the difference, mourns the loss and talks panicky, regardless of the fact that the country at large is getting on about as usual. Of course, Wall street maintains an intimate connection with New York banks, and the banks are able, more or less, to influence conditions.

The approach of 1908, when another presidential election will be held, has something to do with the feeling of uncertainty, but an impartial view of business conditions all over the land brings to light no reason for alarm. James W. Van Cleave, president of the National Association of Manufacturers, was recently asked: "Will American prosperity continue?" He replied that the query could safely be answered in the affirmative. His analysis of the situation included the Wall street alarm, but Mr. Van Cleave denies that Wall street's forecast is correct. In an article in "The Circle," the head of the National Association of Manufacturers says:

"In the existing conditions there is nothing that portends a serious setback. The bank transactions in all the great centers except New York are above those of any previous year, and in New York they are diminished by the lull in speculation, which in itself is a good sign. Railroad earnings and foreign trade are far in excess of all past figures, and the general tendency in each is upward. On the great lakes the traffic is breaking all records. The heavy gains in our imports of merchandise remind us that though our factories and workshops of all sorts are producing more goods than ever before, they are falling far short of the home demand. This compels our people to look abroad for a larger and larger portion of the things which they need. From 1900 to 1907, while the country's population has grown 15 per cent, its pig-iron output has increased 100 per cent, and its steel production has expanded 120 per cent."

With bank clearings, railroad earnings and foreign trade —constituting the barometer of general business conditions —all steadily climbing upward Mr. Van Cleave sees no sign of impending trouble. He predicts tariff revision after the next presidential election but thinks it will be handled by a commission which will act wisely and with the least possible disturbance to trade. In short the head of the manufacturers' organization sees no prospect of a falling off in business expansion for many years to come.

FROM ACROSS THE SEA.

TELEPHONY publishes every month a delightful page of "Items from the Rural Line Districts," being telephone intelligence selected from small local newspapers. A report in the San Jose Mercury tells how eight girls in the local telephone company "quit work" because the manager told them that their conduct at a picnic on the previous Sunday was unladylike. It seems that the chief diversion had been tree-climbing, and that one of the principal stockholders had observed and reported them. In the mind's eye one pictures the eight maidens on the bough, each "like eny swalwe chiteryng on a berne," as Chaucer has it; the entry on the scene of the scandalized stockholder, and the subsequent indignation of the girls at being styled unladylike. It does not appear whether the stockholder was moved to wrath by the actual desecration of the Sabbath, or by the simian calisthenics of the ladies in the trees. Perhaps he objected to the "overcrowding of the trunks."—National Telephone Journal, London, England.

WORKING CONDITIONS OF "CENTRAL."

A SEVERE indictment of the Canadian Bell's treatment of its telephone operators is contained in the report made by the Dominion commissioners who investigated the operators' strike at Toronto. Too long hours, meager pay and a general disregard for the "hello girls'" health and comfort are charged against the Bell by the government investigators who earnestly recommend a six-hour day and sufficient reliefs to enable the operators to do their work well and without injury to their welfare. In summing up their report the commissioners declare that the strike was justified inasmuch as the change of hours "was made, we believe, from motives of cost and service pure and simple, and without any real consideration for the health and well-being of those whom it was most to affect."

In arraigning the Canadian Bell's method of dealing with the Toronto operators, the commissioners found that the five-hour schedule was merely an arrangement under which the employes were obliged on a certain number of days in each month to perform seven or six and one-half hours' service at the five-hour rate; on other days to work two continuous five-hour stretches, or ten hours at exactly double the five-hour rate; at all times to be ready to work without remuneration an additional fifteen minutes, either before or after the five-hour period, or both, and in at least one case,

to give, on pain of dismissal, service without compensation for several hours each day over a period of two weeks or more.

By way of correcting such conditions the commissioners recommended that the period of work should be made not to exceed one and one-half hours at a stretch, in which event the periods of relief might be fixed at twenty minutes, and the intermission for those who desired it placed at two hours or an hour and one-half, instead of one.

The commissioners also declared that it should be made a crime for employers to work women at high pressure for undue periods; that only girls over 18 years of age should be employed in the telephone office; that they should have proper periods of recreation and relief and "overtime" made prohibitive, and that a commission of medical experts should further consider the conditions of the operators. In this connection some of the medical witnesses suggested the construction of the switchboard so as to do away with the necessity of far reaching, the perfecting of the lighting of the switchboard and devices used for discovering the numbers; the sterilizing of the mouthpiece used by operators each day, instead of once in two or three months, and the providing of each operator with headgear for her exclusive use; the construction of the seats so as to make them more comfortable and so as to permit of an operator standing, the operators not to be required to be seated continuously; a more effective and better ventilation of the operating room.

As another aid to operators the commissioners recommended that whatever the period of working hours may be, overtime should be absolutely prohibited, as should also the practice of compelling operators to work a fraction of an hour either before or after the schedule time, with, or as has been customary at the Toronto exchange, without compensation.

The government investigators hit the Canadian Bell squarely between the eyes by saying that it derives its profits by "sweating" or "by levying a tribute upon homes and individuals for which no compensation has been made. This is sufficiently proven by the admissions of its own manager that the wages paid were not sufficient to meet the cost of board and clothing and that, notwithstanding, the operators had been obliged to work at a pace which was absolutely detrimental to their health."

Bell officials in the United States hasten to say that conditions are more favorable for the operators in this country, which is easily believable. It is worthy of note, however, that Ethelbert Stewart, of the United States Department of Commerce and Labor, has called attention to the fact that the Chicago Bell ordinance is painfully lacking in provisions for the comfort and well-being of the operators, and that something should be done to remedy the defect.

The "hello girl" is entitled to more consideration than she usually receives.

A PLAIN STATEMENT

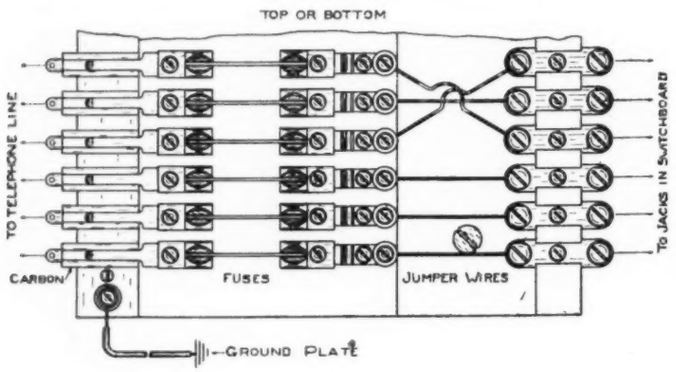
TELEPHONY has been recognized, for so many years, as being the one publication which has never wavered in its loyalty to the Independent cause that it is not necessary to make any statement to telephone men on that point. The fact that other telephone publications have faltered and fallen under the blandishment of Bell money has not deterred us from our plain duty. It was, perhaps, this loyalty more than anything else that led the Telephone Manufacturers' Association to give TELEPHONY its approval and to withold it from three of our contemporaries. This action on the part of the Telephone Manufacturers' Association may have been further influenced by the splendid circulation statement shown. The association asked all the telephone publications to submit post office receipts for a designated issue. TELEPHONY'S post office receipts showed the splendid total of 7,589 pounds, while the total receipts of our four contemporaries showed but 5,000 pounds. These circulation figures are the most remarkable ever made by a trade paper, showing that in actual pounds we sent out 50 per cent more weight than ALL four of our contemporaries combined. All advertisers will note this circulation test, which deals with figures and not with unsupported statements. Advertisers will and should demand sworn circulation per issue. TELEPHONY had a larger GUARANTEED circulation in its issue of January, 1901, than the claimed circulation of any other telephone publication to-day. TELEPHONY swears to its circulation. The other publications should do likewise, but dare not for obvious reasons. The line on the outside front cover of TELEPHONY which reads "Sworn circulation this issue over 10,000 copies" is striking dismay to the hearts of our contemporaries, who are finding out that they can't "fool all the people all the time."

QUESTIONS AND ANSWERS

By H. P. Clausen

I HAVE PURCHASED a combined protector and cross-connecting board. The arrangement is built as shown by the sketch which I send you. The fuses are mounted upon mica discs, and in addition to the fuse protection, carbon blocks are supplied for the purpose of giving protection against lightning. I should like to know how these different terminals should be connected, and if it does not cause too much trouble, state the reason for locating the connections as you may advise as being the best way to arrange the equipment.—F. R. S., Indiana.

Illustration of the arrangement which you submit is reproduced herewith. At the left of the illustration certain terminals have been marked "To telephone line." These



terminals should connect to your telephone lines and if your telephones are brought into the exchange through cable, the cable conductors must of course be connected to the terminals marked "Telephone line." At the right of the illustration we have marked the connectors "To jacks in switchboard." These terminals then connect to the spring jacks in the switchboard and from there of course to the drops and from the drops to the ground or common return circuits. And if metallic system is used, to the remaining mate of the metallic line. The space marked "fuses" is intended to take up the fuse links, which, as you have explained, consist of mica discs with a fusible wire mounted upon the face of it. The space marked "jumper wire" is intended to permit you to connect together any line wire in the exchange with any particular drop circuit without requiring the changing of permanent cable connections, the shifting of connections being accomplished by changing about the wires which are very appropriately termed "jumper wires."

Referring to the illustration, we have a jumper wire from the first upper connector on the line side to the third connector down on the switchboard side. Therefore, if the upper connector is line No. 1 and the third connector of the switchboard side is switchboard line No. 3, it is obvious that any telephone connected to line No. 1 would be connected to line No. 3 in the switchboard, and if the subscriber signals for the central office, he would throw the shutter belonging to the drop of line No. 3. The jumper wires as shown in the illustration show the system of distribution for the common return or ground system. Obviously, if you are operating metallic lines, you would always carry two jumper wires, which, as a rule, are twisted together in mates, the insulating cover of the wires generally being of different colors so that you may always have the same side of the switchboard connected to a given line wire. Say you have a twisted pair of jumper wires bearing covering colored red and white. The white wire might be considered the tip wire, and, say, always connects to the upper terminals of a given pair of line wires, and at the same time it would also connect to the upper terminal of the switchboard lines with the understanding that the said upper terminal connects with the tip spring of the subscriber's line jacks. This method of distribution materially aids in locating trouble and also permits of operating ground lines and metallic circuit lines in conjunction with each other without introducing difficulties while connecting lines together, for with a metallic circuit switchboard operating ground lines, it is very important that the line wires are always brought, say, to the tip spring of the line jack and never to the sleeve spring, the sleeve contact being grounded.

From the illustration you will observe we have recommended connecting the line wire to the terminal placed next to the lightning arrester carbon. This is done for the purpose of protecting, first, the jumper wires against any chance of their serving as lightning arrester points, for if the line wires were connected to the right-hand terminals, you will observe the jumper wires would present a very easy method for lightning to jump across from one line to another and do damage in this manner. However, with the line wires connected to the left-hand terminals, as shown in the illustration, lightning discharges generally pass to earth from the ground blocks and it is only with exceptionally heavy discharges that a current passes through the fuse wire and switchboard drop, and it is then that the fuse wire comes into play. In other words, the fuse wire will carry but a very small amount of current and it should not carry enough to permit the switchboard drop being burnt out.

One point which has not yet been touched upon is electric light and street railway crosses. Should, for instance, 110-volt lighting circuit come into contact with the telephone wire, it would not be of a sufficient voltage for jumping across the space between the carbon and the ground. The fuse wire, however, will take care of the excessive current. Now, if we take a 500-volt cross, however, and with the carbon blocks adjusted, say, to arc on any voltage higher than 300, the arcing would actually occur between the line carbon and the ground plate, and with a sufficient amount of energy behind it, it would be either a case of the street railway wire burning its way through the telephone wire, or what would most likely be the case, the wire connecting from your outside line wires to the cross connecting board, necessarily being insulated, would start to burn. This obviously calls for some means of protection between the cross connecting terminal and the outside line wires. As a rule, such a protection is provided by installing fuses between the lightning arrester carbon connector and the point where the exchange cable connects to the overhead line wires, and in order to protect the circuit, it generally is the practice to install fusible links on pole top terminals, which when blown by excessively high voltage will not permit an arc to form across their contacts. That is, a break of three or more inches should generally be considered necessary for the pole top terminal.

Kindly give the writer advice upon the following question: We have a switchboard of the magneto type a wiring plan of which is pasted upon the inside of the cabinet, but from this circuit I cannot obtain the information which I wish to get. The board is equipped with six 1600-ohm ringers, five self-restoring drops, and five cord circuits. As we have party lines terminating in the board, which have the same number of rings upon the different lines, we wish to equip one of the cord circuits with condensers to pre-

vent ringing through from one line to the other when connected. We have read the articles in your paper concerning the systems, but are not quite sure at exactly what point we shall break the wires which connect to the plugs to permit us to attach the condensers, and we ask you to give us a sketch showing the correct circuits. We should also like to know what capacity the condensers should be, what make, and where we could buy them.—J. H., Iowa.

The circuit of the switchboard which you enclosed is shown herewith and identified as Figure 1. You will notice the relative positions of the connections in the ringing and listening key circuits. You will also observe the construction of the switch plug and general circuit connections of the entire board. In the present instance, however, it is only the connection of the clearing out drops and condensers of the cord circuits which you are particularly interested in.

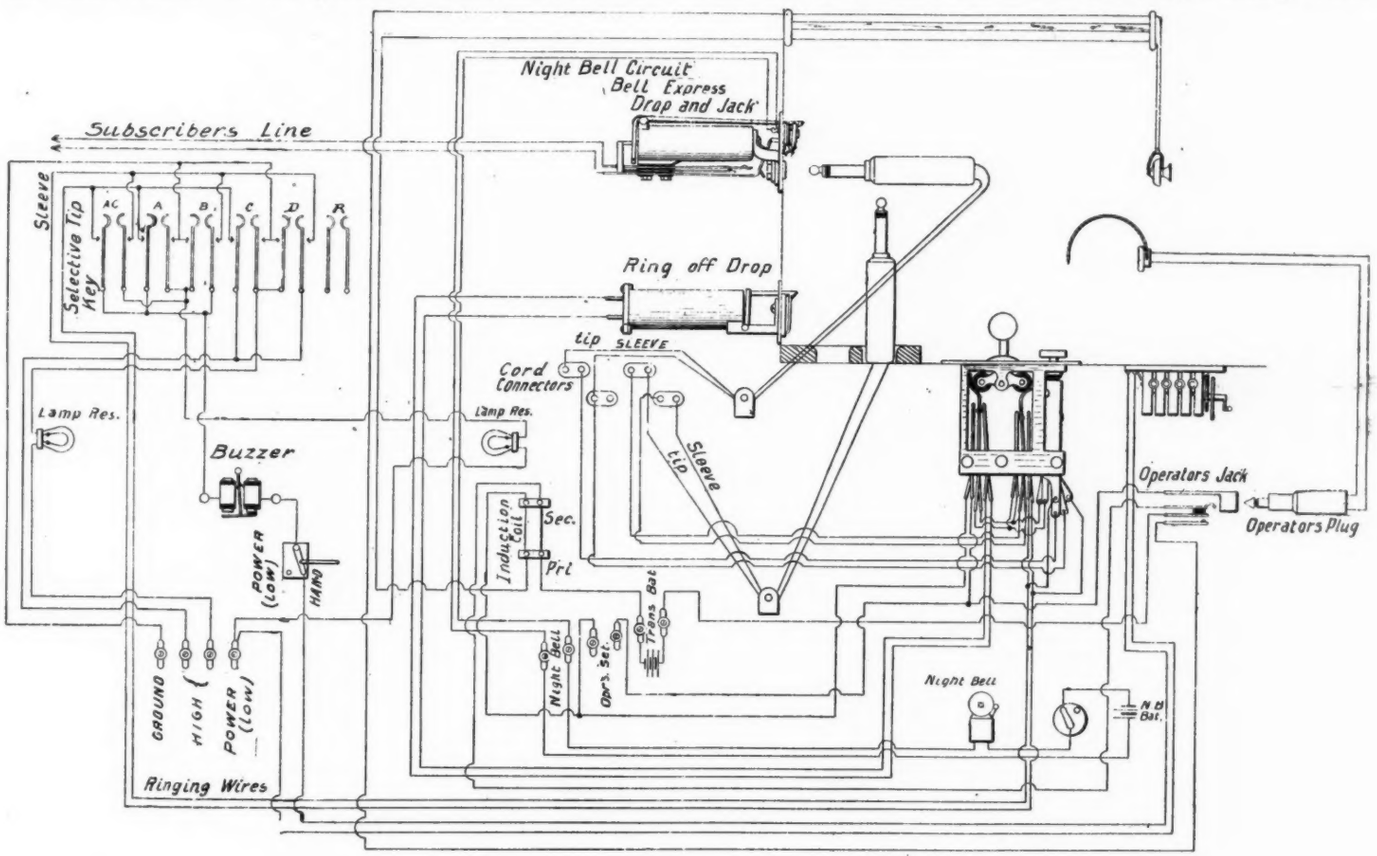


Figure 1.

Referring to Figure 2, you will find the same kind of plugs and jacks, but the cord circuit has been shown in a

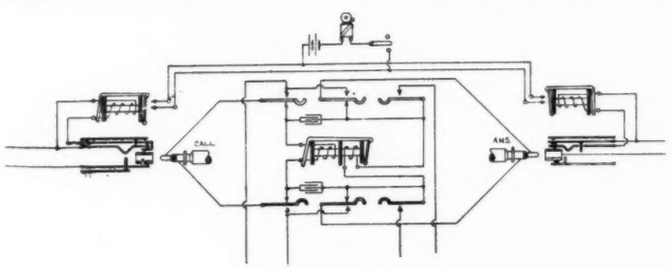


Figure 2.

different manner. Referring to the figure, the calling cord is connected to the selector springs of the ringing key. This refers both to the tip and sleeve of the calling cord. The answering cord connects likewise to the selector springs of the ringing key. This refers both to the tip and sleeve springs of the key which is used for ringing back upon the answering cord.

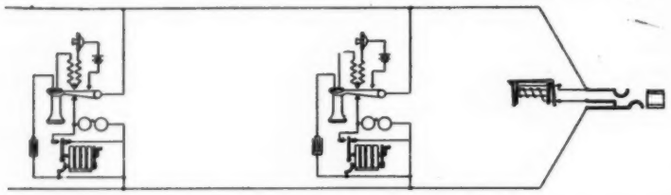
Now, observe that a condenser has been cut into the circuit between the back contacts of the selector springs, connecting to the tips of the answering and calling cord, and that likewise a condenser has been cut between the back contacts of the selector springs connecting to the sleeve contacts of the answering and calling cord. The condensers thus connected complete the talking circuit between the two cords, but in order to complete the circuit connection, we must install a double wound clearing out drop, as shown by Figure 2, the one winding being connected between the back contacts of the tip and sleeve side of the answering cord, while the remaining winding, which is wound upon the same core of the clearing out drop, is connected between the back contacts of the calling cord circuit.

If you will write to the manufacturers of the switchboard, they will give you the correct location of the wires which should be cut in order to install the condensers and clearing out drop, but it is certain that it will be necessary for you to run two pairs of wires from your condensers and clearing out drop to the key, as it is not likely that the key cable contains sufficient wires for permitting the installation of the apparatus without the running of the two extra pairs of wires. If you will write to any of TELEPHONY'S advertisers they will be glad to quote prices on suitable condensers.

With a farmers' line about thirty miles long and with fifteen telephones connected to it, it is found that when more than one or two of the subscribers have their receivers removed from the hook switch, it is almost impossible to signal out over the line from the central office. I intend to install condensers in the telephone circuit, but do not know the exact place where they should be put. Will the condensers used in the regular central energy telephones be all right for this service? Kindly give instructions how to connect.—T. W., Pennsylvania.

Referring to the circuit diagram reproduced herewith, the condenser, as shown, should be connected between the

receiver and the line circuits in such a way that the ringing current from the central office is not required to pass



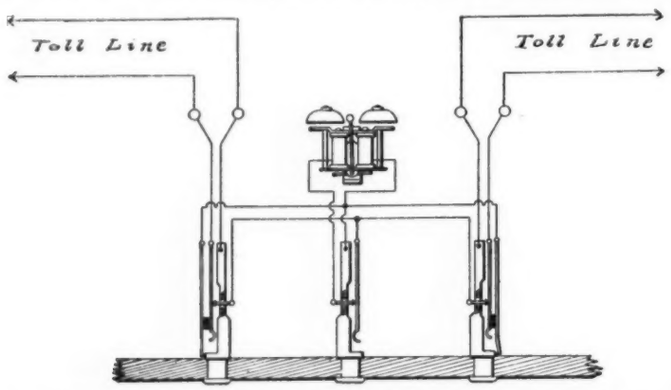
through the condenser and the ringer in series. It will be observed that when the receiver is removed from the hook switch, there is a circuit through the condensers from the line wires and through the secondary of the induction coil and the receiver.

With regard to the capacity of the condenser, the regular common battery telephone condenser is usually of two-microfarad capacity and it will not be suitable for your telephones. The condenser should not be more than ½-microfarad, and in many cases, a 2/10 capacity condenser is large enough. The object of the condenser, it must be understood, is to prevent the ringing current from passing through it and the receiver in any great quantity, for it is the quantity of the current which passes through the receiver at the stations where the subscribers have removed their receivers from the hook switch which robs the line of the current which you need for operating the ringers of the telephones.

If you will communicate with any of TELEPHONY'S advertisers, you will be able to obtain complete information as to prices and dimensions of the condensers.

I have often heard the expression "toll line test station" and, while I have a general idea as to what the arrangement looks like, I do not understand the purpose of such equipment. Kindly give this information and, if it is not too much trouble, give a diagram of the circuits.—A. T., Michigan.

The diagram which we show herewith will give you a general idea as to the circuit connections of a toll line test station, or, as it is frequently called, the "Waterloo" jack



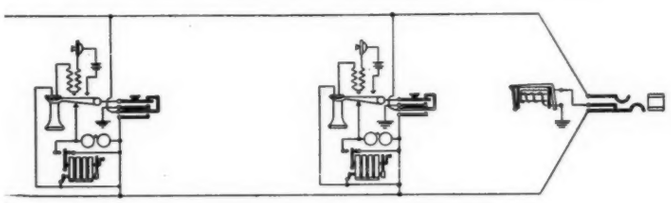
arrangement. It will be observed that the equipment consists of three spring jacks with the signal bell connected to the center jack, an east line to the left jack and a west line to the right-hand jack. If we place a plug into the left-hand jack, the right-hand line circuit is entirely disconnected from the east line, and, vice versa, by placing a plug into an east line jack, the west line is disconnected from the east line, but while this condition prevails, the west line is left connected to the signal bell. Should we plug into the center jack, the signal bell is cut off the circuit and we are also able to listen in upon the line. It will be observed that the object of this circuit arrangement is to permit opening up the line circuit at the test station and permit of testing out upon either line without any interference being had upon the line owing to trouble which may be present upon the remaining line connected to the test station.

I am at the present time in the employ of a telephone company, operating magneto switchboard, containing trunk circuits and also lamp signals. I find it very difficult to keep the current of the batteries up to a point where the lamps are lighted at all satisfactorily. We have in all about ten lamps to light, and find that while we can use dry batteries, they do not last long enough to give us good results. What plan would you suggest to relieve the situation?—T. W. K., Missouri.

You do not state what voltage your lamps are arranged for, but as a new equipment of lamps does not cost very much, it is recommended that you install the 10-volt lamps. This plan may permit you to use the dry batteries with some success, provided you connect two or three sets of dry cells in multiple. Say seven sets of dry batteries give you the correct voltage when the dry batteries are all connected in series, then take three sets of seven dry batteries, each set is then capable of giving you at least 10-volts. Now, connect the three sets in multiple by simply tying together the carbons on one end of the series and the zincs upon the other end of the series. Then connect these cells to your trunking circuits and you will undoubtedly find you are greatly relieved through the trunking circuits not requiring constant attention. It may not be scientifically proper to connect dry cells in multiple, but the fact remains that this plan will work out pretty well, for the voltage of the battery remains fairly constant, and it is the internal resistance of the cell that rises, and for that reason no great loss of current is had through what is ordinarily termed the "bucking" of one set of batteries against another.

I have heard a great deal about systems of farmers' lines in which the central office can be called from any farmers' telephone without causing the bells of the other telephones to ring while signaling the central office. Will you let me have a diagram showing the circuit connections of such a system?—F. R., Oklahoma.

Referring to the diagram below, you will observe that the central office drop signal is connected to the ground, and the remaining side is connected to the sleeve of the line jack. You will further find that the telephones are of the regular bridging type and that if it were not for the push button, which is shown as a part of the telephone, there would not be anything special in the instrument. In



other words, it would be the regular bridging type telephone.

The function of the push button is to ground one side of the generator and connect the two-line wires together to the other side of the generator. Now, it is obvious that when the push button is pressed the line wires are short circuited, and at the same time, while driving the magneto generator, the drop at the central office will respond.

The reason for short circuiting the line wires lies in the possibility of there being considerable resistance between certain stations, and if the line wires were not short circuited there still is a possibility of interfering rings being heard at certain stations. However, if you wish to install a simple push button, leave off the short circuiting portion of the circuit and ring into central directly over the sleeve wire.

Taking a telephone line with fifteen instruments connected to it and all batteries in telephone are cut out and all receivers are left off the hook switches, so as to connect them across the line, would it cut any figure in the talking, say, from the telephone located at my house? If so, would it make any difference in the power of the

speech transmitted, assuming, of course, that the batteries in the telephone at my house are in good condition?—O. A. V., Missouri.

If you have a telephone circuit with fifteen telephones connected to it, and all receivers are left removed from the hook switches, while you are endeavoring to talk from one end of the line, say, to the other, you will find quite a difference in the power of speech transmitted. It will depend somewhat on the length of your line, distance between stations, size of line wire, as to how much the speech will be cut down. Disconnecting the batteries will not make any material difference in the talking qualities. That is, practically you will not be able to tell the difference; theoretically, of course, the circuit should talk best with the batteries disconnected at the intermediate stations, because when the batteries are connected, there is found to be a certain amount of side tone heard from the different stations; and moreover, with the primary circuit of the induction coil open, the secondary of the induction coil would present a slightly greater impedance, and therefore cause less loss in current from your station.

Another feature which might affect the transmission is the installation of condensers in the talking circuits of the different telephones. If the telephones have condensers, say, of two-tenths microfarad capacity, then the transmission over such a line with all receivers removed will be better than with no condenser installed, but as a general conclusion, you can take it for granted that when the receivers are all removed from the hook switches, or even one or two, you are not able to talk over the line as well as you can when only the ringers are left across the line.

If it is not too much trouble I would like to have you advise me of the proper way to adjust a telephone ringer. I have tried a number of different ways, and while I have obtained pretty good results, it appears that there must be some way which is considered the best. Kindly answer in your next issue.—F. L. R., Ohio.

In adjusting a telephone ringer, the prime requirement is that the armature of the ringer must first be adjusted towards the pole pieces of the ringer magnets, so that a perfectly free movement of the armature is obtained while driving the hand generator of the telephone at an ordinary speed. Adjust the armature towards the pole pieces or away from it until you find the best point. As a rule it is safe to leave about one-sixteenth of an inch between the armature and one of the pole pieces while the remaining end of the armature rests against the pole piece of the remaining magnet. From this point you can either adjust towards or away from the magnets in order to obtain the best position.

Before finally adjusting the gongs it is well to examine the armature screws. You will observe that a pivot screw passes into the side of the armature and that there is a certain tension easily applied which will prevent the armature from moving freely. It is best to run the pivot screw against the armature so it binds and then take about a quarter or even less of a turn backwards, then set the lock nut, and a few trials will quickly locate the position where if any more tension were placed upon the pivot screw the armature would not play freely. Observe this effect by tightening up the screw and after turning it back, find that the armature moves freely, then draw up the lock nut, and in most cases it will be found that the adjustment is just about right. In some cases, however, depending upon the fit of the screw in the frame supporting it, the drawing up of the lock nut loosens the adjustment owing to the pivot screw being drawn outward. In other cases it may be found that the lock nut fits very well upon the pivot screw and when you endeavor to lock the screw in place, it is necessary to keep the screwdriver in the slot of the pivot screw and hold the screw in the proper position, for if this is not done, the lock nut carries the pivot screw around and causes the armature to be bound fast and therefore requires readjusting.

Assuming, however, that the correct pivot adjustment has been made and that the play of the armature is perfectly free, drive your generator and carefully move the gongs towards the tapper. Upon the tapper striking one of the gongs, move the other gong in place so it will also be struck by the tapper. Now move both gongs to one side or the other until you obtain the most satisfactory ring. Now cease driving the generator and observe when the tapper is thrown to the left that it does not touch the gong, and further when thrown to the right there remains a certain space between the tapper and the gong. Now give the armature quite a sharp rap by pressing it alternately against one or the other pole pieces, and it will be found that the tapper swings over far enough to strike the gong and at the same time jumps back immediately without interfering with the free vibration of the gong. This, then, is the proper adjustment of a ringer. Of course, when a ringer is adjusted without having any line resistance in the circuit, it is possible when endeavoring to signal a station over a high resistance line that the gongs must be moved somewhat closer to the tapper, for the stroke will not be as powerful when ringing over a high resistance line. In such cases it will be found that when the gongs are moved close enough to the tapper that while a satisfactory ring is obtained when ringing over a long line, the ring is not always so satisfactory as when produced from current sent through the ringer coils over a line with very little resistance.

The adjustment of the ringer, therefore, is quite a little trick which every inspector acquires only after considerable practice, but the principles involved in making the proper adjustment are outlined above and a little practice will permit anyone to secure excellent results.

Is a common battery system practical for a village exchange of less than 300 telephones? Is it more complicated and is the cost of maintenance higher? Also what is the cost of installing such a system as compared with the cost of a magneto system?—G. W. C., Minnesota.

The installation of a common battery switchboard and the maintenance of such an equipment costs more than a magneto system. In the common battery system you are required to supply at the central office means for charging storage batteries, and such means generally include some arrangements permitting easy supervision and control of the battery charging machine as well as the storage batteries, and it may be safely assumed for an exchange under 300 lines, such as you appear to have in mind, that a magneto system should be the one selected by you as the most suitable type.

In operating telephone circuits between two towns, I have been obliged to run six wires, and in order to save expense these circuits are operated upon the ground return plan. There is considerable cross talk between the lines and also noises due to electric light currents. As we use the lines mostly during the day, however, the electric light does not trouble us so much, but if there is any way to prevent the cross talk, I should be glad to know how this can be done.—R. W. J., Iowa.

While you do not state the distance between the two towns, it is assumed that the lines must be at least five or six miles long. There is no way through which you can overcome the effects of cross talk between the different circuits, unless you make them metallic. This of course is the well understood way to accomplish the result. It may be suggested, however, that with the efficient telephones which we have in our exchanges to-day we can well afford to sacrifice something in the loudness of speech transmitted, for by doing so, we can avoid interference between parallel circuits. It is suggested that if the distance between the two towns is not too great, and if the service is largely of a local character, that you obtain a repeating coil of the step-down type, which will permit you to reduce the voltage of the current passing over the lines between the two towns.

If you take, say, a repeating coil of the one to three type, in which the original current is stepped down to one-third the original volume, and connect the low winding to the line circuits, it may be productive of some beneficial results. Of course, instead of using a repeating coil you may attach some sort of a resistance from the line wire to earth at each of the exchanges and rob the line of considerable current and in this way cause less trouble from cross talk.

In order to observe the effects of reduced cross talk, simply connect the telephone receivers to each end of, say, two of the line wires which are strung upon adjacent pins. Now, hold a conversation over the two lines by speaking into the receivers and you will undoubtedly find very little cross talk present; still you are able to hold a conversation. That is the principle which would be taken advantage of by reducing the intensity of the current passing over the lines.

Being in the employ of an operating company, and practically having charge of the inside and outside construction work of a 500 line magneto exchange, I would like to know whether there is any way through which I can obtain experience in the construction and operation of common battery switchboards. What plan would you advise me to follow? Should I enter the employ of a manufacturing company or obtain a position with an operating company, where the common battery boards are being used?—F. R., Illinois.

From the tone of your inquiry it would appear that you have had at least three or four years' experience in telephone work, for having charge of a 500-line exchange, both inside and outside work, shows that you have a good general knowledge of telephone work. With reference to advising you whether to take a position with an operating company or whether you should take a position with a manufacturing company, this would be rather difficult to discuss intelligently, unless more information regarding your ability in the direction of handling tools is had, and whether you understand circuit connections and installing wires and apparatus in switchboards. If you apply to a manufacturing company for a position, it is natural that you would ask for a position in the switchboard department. If you enter the employ of a small manufacturing company, you might within six months or a year gain a pretty fair knowledge of the construction of switchboards in general, but not all small manufacturing companies make large multiple switchboards, particularly the common battery type of apparatus, and that is what you wish to study particularly. The writer believes that the best suggestion that can be offered to you is to obtain a position with an operating company just installing a new switchboard or endeavor to secure a position with the manufacturing company while it is installing the switchboard. Then you will gain an excellent knowledge of the location and disposition of the different pieces of apparatus entering into the construction of a multiple board, and if you have any special ability, it is sure to crop out while you are one of the manufacturer's installation gang. It will remain entirely with you to obtain the best advice for future work from those in charge of the installation. Of course, the other plan would be to enter the employ of a company operating common battery switchboards, but you will find it very difficult to get as desirable a class of experience as you would if you were to actually take part in the installation of a board, particularly if you were on a job from start to finish, and afterwards obtained a position from the telephone company as switchboard man.

PAY STATION THIEVES CAUGHT.

J. A. Striker, manager of the Mt. Morris (N. Y.) telephone exchange, has won a reputation for himself not only as a Sherlock Holmes, but as a long distance sprinter. For some time past the pay stations in railroad stations in towns like Elmira, Scranton, Binghamton, Bath, Corning and Cohocton have been rifled of their store of nickels and dimes, and finally $100 reward was offered for their capture. One morning recently Manager Striker was notified that the cash box in the booth at the Lackawanna station had been tampered with. Mr. Striker proceeded to investigate and went down to the railroad station. As he walked in he noticed two young men in the waiting room. He went into the booth and began examining the cash box, and as he did so he noticed that the young men got up and went out of the station.

This aroused his suspicion, and, on looking, he saw them running down the track toward Genesee river. Striker gave chase, and being quite a sprinter, struck off at a fast pace. It was a hot race between the two young men and the manager to Moscow, four miles away. All were nearly winded when they reached Moscow, but Striker called to his assistance Constable Curtis. They arrested the young men in a pool room and searching them found in their possession quite a sum of money in nickels and dimes.

Not having any warrant for their arrest they let them go and the thieves boarded the train for Buffalo. Striker sent on a description of the two young men to the police of Buffalo, and when they got off the train they were arrested and Striker notified. The manager and Deputy Sheriff O'Leary went to Buffalo and brought the young men back here and locked them up. The names they gave were Henry Smith and Harry Shay, and they said they were from New York.

The two men were committed to the Geneseo jail to serve a sentence of thirty days.

SQUIRRELS AND LEAD CABLES.

Out in Kansas telephone men have been greatly bothered by squirrels damaging the lead cables. One of the foremen at Parsons wrote the general office about the matter asking what should be done to keep the rodents at bay. The following facetious answer was received:

"Specifications No. 23.—How to prevent rodents from destroying lead cables:

"General.—This specification is intended to set forth a method of preventing squirrels from gnawing the lead sheets from aerial cables, and while some of the suggestions may seem to be of a frivolous nature they are presented in good faith and with the expectation that they will be closely followed.

"Method.—It has been suggested that the foreman in charge of the infected district place a man upon each pole and instruct him to make a noise like a nut, thus enabling him to coax the squirrel near enough to be caught and killed. But owing to the scarcity of men since the strike, and the fact that several of the men have already gone nutty over this scheme, it is not deemed practicable.

"The best method obtainable at the present time is to hang below each cable hanger a nut of some variety, placing them in the order named: Upon the first hanger, place a peanut; second, a hazelnut; third, a walnut; fourth, a hickory nut; fifth, a butternut, and sixth, a beechnut.

"It is suggested that about every ten feet two nuts be placed under a hanger. This will cause the squirrel to think that he has suddenly become cross-eyed, and the scare will cause him to lose his foothold and the fall will kill him.

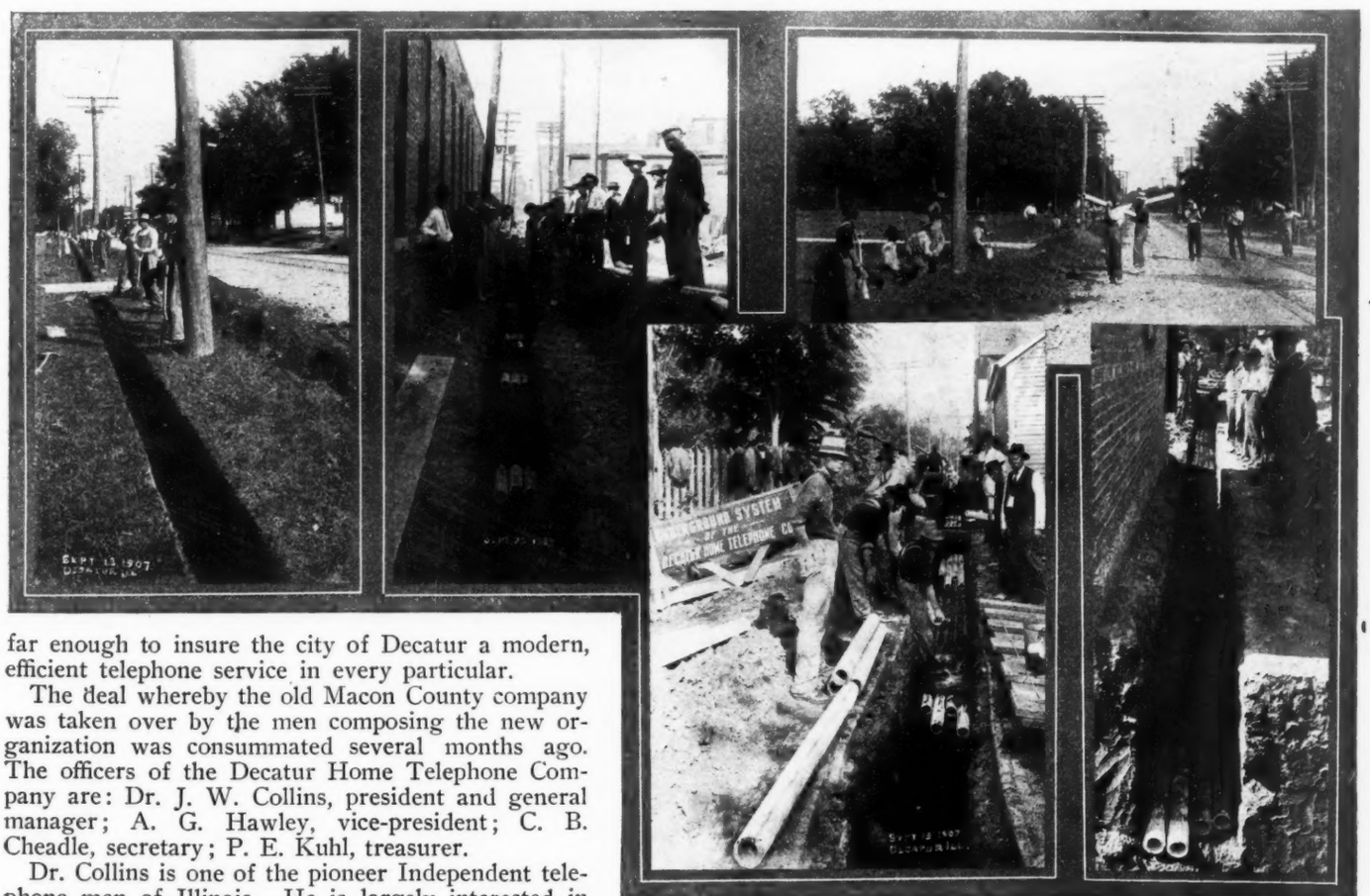
"If he has not been killed by the fall, but is crippled so that he may be caught, grasp him firmly by the back of the neck and tickle his ribs until his mouth opens wide with laughter, then fill him full of lead shot, which will cause him to sink, then throw him into a vat of sulphuric acid. This will eat away all the animal matter and the remaining lead from his system may be sold for junk."

MODERN SYSTEM AT DECATUR, ILL.

A New Independent Telephone Company is Replacing the Old Plant in That City and Making Many Extensive Improvements

By D. R. Craig

DECATUR, Illinois, is to have one of the finest Independent telephone systems in the state—or, in fact, in the entire country, considering the size of the city. The old plant of the Macon County Telephone Company is being replaced by a new system which is being put in by the Decatur Home Telephone Company, which has succeeded the former concern, and the work has progressed far enough to insure the city of Decatur a modern, efficient telephone service in every particular.



The deal whereby the old Macon County company was taken over by the men composing the new organization was consummated several months ago. The officers of the Decatur Home Telephone Company are: Dr. J. W. Collins, president and general manager; A. G. Hawley, vice-president; C. B. Cheadle, secretary; P. E. Kuhl, treasurer.

Dr. Collins is one of the pioneer Independent telephone men of Illinois. He is largely interested in the Independent company at Lincoln, Illinois, and is the virtual owner of the company at Pulaski, besides possessing other telephone holdings. He has given up the practice of his profession and now devotes his entire attention to the telephone business.

Mr. Hawley is another pioneer in the Independent field. He left the newspaper profession to give his whole attention to his telephone interests, which had become so large as to demand his entire time. He is president and general manager of the Hawley & Cheadle Construction Company, an organization that is making a fine record in its line of business. He is also president and general manager of the Tri-City Telephone Company at Clinton, Iowa; holds a like position with the Dixon Home Telephone Company, at Dixon, Illinois, and is stockholder in several other Independent enterprises.

Mr. Cheadle is also justly entitled to a prominent place among the Independent pioneers. He has been connected with the Independent telephone movement in Illinois since its early days and is considered one of the best authorities on telephone law in the state, occupying the position of attorney for several Independent companies. He is secretary and treasurer of the Hawley & Cheadle Construction Company, secretary of the Tri-City Telephone Company and fills a similar position with the Dixon Home Telephone Company. He is also the efficient secretary of the Illinois Independent Telephone Association.

Mr. Kuhl, the treasurer, is a banker of Lincoln, Illinois. The telephone business is not new to him, for he has large interests therein, and the fact that all of them are profitable is due in a measure to his wise counsel and direction. Associated with these gentlemen, as directors and stockholders, are a number of men, living in Decatur and elsewhere in the state—men of means and stability, whose past experience in the telephone business enabled them to see the value of the Decatur proposition.

A new and favorable franchise was secured and within ten days after the company changed hands an engineer and construction men were on the ground to begin work on

the new plant, which will involve an outlay of about $300,000. It is the intention of the company to make the Decatur plant the equal of any in the country, so far as quality and modern methods are concerned. This work is in the hands of the Hawley & Cheadle Construction Company, which is putting forth its best efforts to make it a success. With the exception of some available underground conduits the entire old plant has been discarded, just as if it never existed, and all the work will be new.

The underground system for the new plant has been completed and is most extensive of any in the country for a city the size of Decatur. Larger cities in the state may have more conduits, but no city in Illinois possesses a subway system that covers the territory so comprehensively. The conduits extend to the city limits in four different directions and the intervening territory is fully covered. Over 150,000 feet of new conduits have been laid, which with the 50,000 feet available in the old plant brings the total to more than 200,000 feet, connected by 190 manholes. All large business blocks and public buildings are entered direct through the subways. The Chicago Stone Conduit Company's conduit was used, laid in a substantial encasement of concrete. The accompanying illustrations give a good idea of this work. The manholes are built of brick with iron supported roofs, giving large and roomy vaults.

On account of the extensive underground system the amount of pole and aerial cable work for a plant of this size will be comparatively small, but the poles used, both for lines and distribution, are of specially selected western timber, the best that could be procured. Circle top and multiple cable distribution will be used throughout the plant. The first installation of underground cable will be over 125,000 feet, providing 3,200 pairs of conductors from the exchange. This cable will be No. 20 B. & S. G. double wrap dry paper insulation, with a .09 capacity.

A handsome new building of its own, located in the heart of the business district, will be the home of the company. Work has been commenced on this structure, which will be three stories and basement, forty by eighty feet in dimensions, with a front of distinctive design. Commodious and attractive quarters for every department of the business are provided.

The equipment will be furnished by the Automatic Electric Company, of Chicago, the contract for its apparatus having been recently closed. It is, of course, conceded that to give telephone service automatically is a modern method, and in keeping with this idea every part of the new plant, inside and outside, is being constructed according to modern methods. The first installation of apparatus provides for full equipment for 1,600 stations, so arranged that it can easily and quickly be increased as the business grows and the occasion demands. The spirit in which the telephone-using public of Decatur has taken the announcement that they are to have an automatic exchange shows that, although in the past they have suffered from miserable service, they are abreast of the times from a telephone standpoint, and that a cordial and substantial reception awaits the new system.

The pole line construction is now under way to be followed by the cable installation and it is the desire of the company to have its new plant in operation by the early part of next summer. Of course, the Bell opposition has at last awakened from its lethargy and is making a belated effort to impress the public by the erection of a limited number of poles and the installation of a few feet of cable. No improvement in service is apparent, however, nor is any expected.

During the underground construction the Hawley & Cheadle Construction Company worked a force of 200 men with a labor payroll of over $1,800 a week, and they are at present employing about 100 men on the work. D. R. Craig, the company's engineer, is in charge of the construction and is assisted by a corps of capable lieutenants. It is the purpose of the company to push the construction as rapidly as is consistent with good work, and when completed Decatur will have a system with no superior so far as quality is concerned. Its owners believe they will possess a substantial and profitable telephone investment.

DECISIONS AFFECTING TELEPHONY

By Gilbert W. Hand

INDIVIDUAL PERMISSION MUST BE OBTAINED BEFORE COMPANY CAN CONSTRUCT ACROSS INDIAN RESERVATION.

IN 1900 the Bell Telephone Company obtained permission from the council of the Tonawanda nation of Seneca Indians to erect lines of telephone across the reservation. No authority was obtained from the individual owners and under the general authority from the representatives of the nation it erected certain lines. Later, ejectment proceedings were commenced by an individual Indian who claimed that the company had not complied with the law passed in 1902 which provided that any company may erect poles across the reservation, providing it shall pay the Indians holding allotted lands damages therefor. The court of appeals of New York has held that the authority obtained from the general council was insufficient and that the company must obtain permission from the individuals or remove its lines.

Jemison v. Bell Telephone Company, 79 N. E. 728.

PERSONAL INJURIES FROM CONTACT WITH UNINSULATED WIRE.

In an action by a telephone lineman against an electric light company to recover for a personal injury alleged to have been received by plaintiff from contact with an uninsulated part of a wire strung in close proximity to a telephone pole on which plaintiff was working, the question at issue was held not to be one of assumption of risk but a question of due care, and whether there was reasonable inspection on the part of defendant in handling its wires, and of due care on the part of plaintiff in the manner of doing his work in view of the possible and known dangers. Plaintiff was a telephone lineman and was directed to climb a pole to assist in stringing a wire thereon. Defendant electric company maintained a highly charged electric light wire which passed within four inches of the pole and on the side nearest the pole the insulation had been worn or burned off. There was already a man on the pole above the highly charged wire. Plaintiff testified that he looked at the wire from the ground and the insulation appeared to be in good order. He then went up on the opposite side, and by the time he reached the top the pole had swayed sufficiently to bring him near the electric wire, apparently by some action of the man above. In this manner plaintiff came in contact with the charged wire which proved to have been exposed at the place of contact and serious injury resulted. One of the federal courts has held that such facts did not warrant an inference of negligence on the part of plaintiff as a mat-

ter of law, and that it was proper to submit all the circumstances to the jury for its decision on this question.

Gloucester Electric Company v. Dover, 153 F. 139.

COMPANY NEED NOT OBTAIN PERMISSION IN MICHIGAN BEFORE IT MAY LAWFULLY TRIM TREES.

An inquiry has come to the writer asking the authority of a company in this state to trim trees belonging to property owners along its lines. The law on this question was settled in Michigan in 1900 in the case of Wyant v. Central Telephone Company, in which the Michigan supreme court said that a telephone company may trim trees along its lines without asking permission of the owners so long as the trimming is reasonable and necessary and does not proceed to the degree of destroying the trees. It was also said that compensation could not be recovered for the loss from such trimming so long as the acts were justifiable by the company in the necessary duties of keeping its lines in good order, but that as soon as the trimming exceeded this reasonable degree the owner would be in a position to demand and recover compensation. What is reasonable trimming is therefore a question of fact in each case and must be left to the good judgment of those doing the work in each individual instance.

Wyant v. Central Telephone Company, 123 M. 51.

NO SHOWING THAT DEFENDANT COMPANY WAS ACTING OUTSIDE TERMS OF AGREEMENT.

In an action by a Pennsylvania borough (county) against a telephone company to recover on a penal bond which was conditioned to pay to the borough the stipulated penalty if the company should "sell out, or in any manner be controlled by another company," the statement of the claim averred that the company had leased its lands to an individual for the term of nine hundred and ninety-nine years. It was also averred that the object of the lease was to transfer the possession and control of the property to a company or companies unknown to the borough. The defendant company merely set up in an affidavit of defense that it had not sold out to any other company or companies, and that it was not controlled by any other company, and in this affidavit alleged that the lease was made in good faith and without any design that the possession and control of the company should be transferred to any other company or companies. The courts of this state have held that this affidavit was sufficient to prevent recovery by the borough. No other than defendant could testify as to the intention of the company in making the lease, and, if made according to the purposes set forth in the affidavit, there was no effort or intention of giving over the control to any other concern. A judgment was accordingly entered against the borough.

Ridley Park Borough v. United Telephone & Telegraph Company, 33 Pa. Super. Ct. 230.

IN MICHIGAN COMPANY OWNING FRANCHISE MAY SELL WITHOUT PERMISSION OF MUNICIPALITY.

A case discussing the law on this question was decided by the supreme court of the above state in 1899 and contains a review of the decisions up to that year on the question. In 1881 the Telephone & Telegraph Construction Company had received a franchise from the city of St. Joseph permitting it to construct and operate in the streets of that city. Later, the Michigan Telephone Company purchased the rights of the construction company without asking permission from the city and proceeded to erect lines of telephone. The city refused to allow the work of the Michigan company to proceed, and, in fact, pulled down certain poles that had been erected after the purchase. An injunction was thereupon obtained against this action of the city in which the company contended that the authority of the city was limited to mere regulation of the business and that the municipality could not lawfully prevent or stop all construction, and that the demand of the city which it set up that the company secure consent before it could erect any poles was unlawful and could not be enforced against the company. The contentions of the company were sustained, and the authority which the old franchise gave was held enforceable against the city by the purchaser. It was also noted that the Michigan statutes give this authority in substance by providing that corporations may alienate their property, thus extending the terms of an original franchise beyond the corporation to which it is given on the theory that a franchise is a property right.

Michigan Telephone Company v. St. Joseph, 121 M. 502.

FAILURE TO PLACE WIRES PROPER DISTANCE APART.

In a Nebraska case it was shown that an electric light company placed its wires on poles so near to trees that the wires passed through the branches. It was also shown that high potential wires were within a very short distance of low potential wires, and that proper construction required such wires to be placed at least five feet apart and should not under such circumstances be permitted to pass through the branches of trees. On these facts the supreme court of Nebraska has said that the company was guilty of negligence as a matter of law.

Grimm v. Omaha Electric Light & Power Company, 112 N. W. 620.

INJURED EMPLOYE MUST GIVE COMPANY NOTICE OF TIME, PLACE AND MANNER OF INJURY.

The law on this question is stated in a Massachusetts case in which the New England Telephone & Telegraph Company was defendant and interposed the defense to recovery that chapter 106, section 75, of the revised laws, providing that it be notified within a specified time of all particulars of the injury had not been obeyed. The highest court of the state has held in this case that failure to follow the provisions of this statute prevented a recovery against the company.

Cahill v. New England Telephone & Telegraph Company, 79 N. E. 821.

ABANDONED WIRE HANGING FROM TREE NEAR TROLLEY WIRE.

In a recent Alabama case the facts were as follows: One Robert Isble, while walking along Davis avenue, in a suburb of Mobile, passed beneath an oak tree on the edge of a public road and touched a wire fence that was nailed to this tree. When he touched this fence he received a shock of electricity that instantly killed him. There was evidence that a trolley pole of the Mobile Light & Railroad Company projected into the branches of this tree; that through this trolley pole ran an eye-bolt that supported the span wire that held up the trolley wire which was heavily charged with electricity. On the outer edge of this bolt, and on the outside of the trolley pole, was a nut, which had a rounded square face; between the nut and pole was a washer. The Home Telephone Company had formerly maintained a telephone system to Toulinville by means of a number of wires and poles, which ran along Davis avenue and through the branches of this tree. This portion of the telephone system had been abandoned for some months and the wires and poles had nearly all been removed by the company. A few, however, had been left dangling down through the branches of the tree in question. One of these wires had in some way become fastened behind the bolt between it and the electric light wire pole, and came down far enough to reach the wires on the fence beneath. There was evidence that these wires had been left in this condition for some time, but there was no proof of how the wire got fastened in the way it was behind the eye-bolt. On these facts the supreme court of the state has said: "It cannot be denied

that it is the duty of a telephone company to look after its own wires, and to see that they are not left in a dangerous position, and a failure to do this is a proximate cause of injury which results from a loose wire falling into the street." The company urged the position that inasmuch as it was not shown how the wire was fastened to the fence there was no reason to hold the company liable for the injury, since a stranger, as it was suggested, might have purposely fastened the wire in the dangerous place. The court refused to follow this reasoning and said: "If the wire was loose and dangling in the street, without being fastened to anything, would it not have been quite as dangerous, if not more so, than if it had been tied to the fence? In either case, it would have been dangerous, and liable to charge the fence with electricity."

The case presents another rule of law which is well worth attention. There was at a time previous to the suit a settlement or satisfaction entered into between the person acting for the deceased child and the electric light company, which provided among other things as follows: "It is, however, expressly understood and agreed that this payment is made only on account of any sum that I may be entitled to recover for the death of said Robert Isble, and in consideration of my release of the said Mobile Light & Railroad Company from any liability for damages on account of said death, but it is not intended as a satisfaction of the entire amount that I may be entitled to for said death nor as a release of any claim that I may have against the Home Telephone Company, or against any person or corporation other than the Mobile Light & Railroad Company." The telephone company sought to make this release a bar to any recovery against it but the court held that it released the telephone company only to the degree that the entire claim was settled and was a partial payment of the damages and nothing more. It will be recalled that in the September issue of TELEPHONY in this department a case was discussed in which a state of facts very similar to this received attention, but in that case the release was a complete release without any limitations upon it although nothing was said about the claim of anyone other than that of the company released. There the court held that the release freed all parties from further liability. It is, therefore, the law as decided in these two cases that a release of one of two joint wrong doers will release both, unless it is specially stated that it is given as a limited release to the one to whom it is given and will be considered a partial release as to the other thus preventing a recovery for more than the balance between that paid in the settlement and the full damage as determined by the jury.

Home Telephone Company v. Fields, 43 Southern, 711.

FORT WAYNE COMPANY WINS.

The Fort Wayne (Ind.) Home Telephone Company's contention that a municipality has no right to run high voltage electric wires on the telephone company's poles has been upheld in the courts. This outcome is of the most vital importance to telephone companies in general, and the Fort Wayne Independents have performed a valuable service to the industry in winning a favorable ruling on a point of more than ordinary significance to telephone men. Judge O. N. Heaton of the superior court handed down the decision which practically prevents the city of Fort Wayne from stringing municipal lighting wires on the Home company's poles.

Because of its wide significance to telephone companies generally, Judge Heaton's decision is given in full as follows:

"The city of Fort Wayne granted to the Home Telephone and Telegraph Company privilege to construct and operate a telephone system. One consideration for that privilege was an agreement between the parties that the telephone company will permit said city, free of cost, to use for its police patrol system and any other purpose the upper cross-arm on any and all poles erected and maintained by it within said city.'

"The city is now constructing a lighting plant and the telephone company refuses the city privilege to string electric lighting wire on the upper cross-arm of its poles. In this action the city asks for a permanent injunction to be granted on final hearing, but in the present presentation of this cause the court is not asked to determine the merits of the controversy as presented by the complaint for permanent injunction, but to make an interlocutory order enjoining the telephone company until the final hearing of the cause from interfering with the city in removing the telephone company's wires from the top cross-arm of its poles and to permit the city to place its electric light wires upon the top cross-arm of said poles. Thus it will be seen that the granting of this temporary injunction is not required to prevent any affirmative act on the part of the telephone company or to maintain the property or subject matter of this controversy in statu quo until a full and final submission of that cause.

"I believe this would be too strong a use of the court's extraordinary power by injunction. The sole object of an interlocutory injunction is to preserve the subject in controversy in its then present condition without determining any question of right merely to prevent the further perpetration of wrong or the doing of any act whereby the right in controversy may be materially injured or endangered.

"It cannot be used for the purpose of taking the property out of the possession of one party and putting it into possession of another, nor does it go to the extent of ordering the defendant to undo what it has already done, and since it might thereby be productive of as much injury to defendant as that of which the aggrieved party complains.

"The jurisdiction therefore being exercised to prevent further continuance of injurious acts rather than to undo what has already been done on an interlocutory application for an injunction, courts of equity will only act prospectively and will interpose only such restraint as may suffice to stop the mischief complained of and preserve matters in statu quo.

"It is not claimed in this cause that the defendant will commit any affirmative act and no evidence has come to the attention of the court to justify a conclusion that the city will be injured by leaving the matter in statu quo until the final hearing.

"For the reasons here stated the court will not grant the temporary injunction, and as one reason is enough, I need not say more, but counsel have with great ability and thoroughness argued the law of the case and I believe it is my duty to state briefly the opinion I have formed. First—What is the meaning of the contract? The troublesome words used are these, to-wit: 'City free of cost to use for its police patrol system and any other purposes the upper cross-arm on any and all poles.'

"It is not contended by either party that the words 'and any other purposes' can be literally construed and give the city a right to make such a use as would be destructive of the proper use of the poles by the defendant in its telephone system. I am of the opinion that in determining the meaning of this contract we must consider the questionable words in connection with the contract as an entirety. It was intended to give the telephone company the privilege to construct and operate a telephone plant in the city of Fort Wayne. The city has the right to use the upper cross-arm on the poles for its police patrol system as specifically stated, and the words 'any other purposes' mean any other purpose of the class or kind specifically stated; the right of the city to use the upper cross-arm on poles for its police patrol system indicates a right to string wires thereon and carry a current of electricity. The city has the right to use the upper arm in question and place thereon its electric lighting

wire provided the wire is not of a weight and character or the current of electricity to be transmitted thereby is not of a voltage or power inconsistent with proper construction and operation of the telephone system.

"The telephone company in the execution of its contract will be required to construct and erect poles and put thereon cross-arms of a kind, character and a manner reasonably fit for this privilege in the establishment of a telephone system in Fort Wayne and with a proper regard for the right of the city to use the upper cross-arm for purposes reasonably consistent with such a telephone plant and its proper operation.

"It is contended by the city that its proposed use of the upper cross-arms will not injure the telephone plant, or if it does do so, it will be the fault of the telephone company in not having properly executed its contract for the construction of its telephone plant and the city's right to use poles. The telephone company replies that its poles, cross-arms and wires are a proper kind and construction for its use as a telephone system, but that the stringing of electric lighting wires thereon as proposed by the city, would be inconsistent, a destruction of its telephone plant and endanger the life of every user of its telephone. These are questions of fact too important for the court to determine in fairness to either party by the mere presentation of affidavits as has been done by the parties in this cause on its application for a temporary injunction. The importance of the question requires the presentation of witnesses and a full investigation of the facts on the final hearing and until such a time, the right of injunction prayed for will be deferred."

The case will have another hearing, but as both sides—the city and the Home company—went into the merits of the matter in full the court intimated that the final decision will be in favor of the telephone company, unless the city can show that the municipal lighting wires are no heavier than the telephone wires and that they do not carry more voltage, which all agree is impossible.

BELL DESERTED IN TEXAS.

The decision of the Southwestern Telephone (Bell) Company to raise its rates at Abilene, Texas, has had the effect of driving many telephone users to order out the Bell instruments and subscribe for the Independent service supplied by the Roberts Telephone and Electric Company. October 1 the Bell manager notified his patrons that after November 1 the rates would be elevated. Almost immediately the people began to flock to the Independent company, and, as C. W. Roberts, the president, writes TELEPHONY, "they are up in arms and running over each other in their effort to take the Independent service. I have done little recently but enter orders for telephones."

Mr. Roberts organized and built the Independent telephone system in Abilene in May, 1895, and it was incorporated in April, 1902, as the Roberts Telephone Company. The Northwestern Telephone Company began business in Abilene in October of 1901. The rates at that time for residence telephones were $1 and $1.50, respectively, and $3 for business houses. There was a protest from the business men at paying $6 per month for the use of the two telephones and they called a meeting in January, 1902, and asked that the representatives of the companies make them a rate. C. W. Roberts, of the Independent company, made them a proposition, which was met by the Northwestern, of $1.50 for the business houses and $1 for the residences, such rate to remain in force until either or both of the companies had as many as 300 subscribers, when it had permission to raise. The proposition was agreeable to the business men and was fulfilled by the companies. The Roberts Telephone Company, according to agreement, raised its rates November 1, 1902, when it had 365 subscribers, to the present rates, which remain the same. The Southwestern Company came into Abilene and bought out the Northwestern Company in the latter part of 1902 and in the latter part of 1903 had over the 300 subscribers, and according to the privilege in the agreement with the business men raised the rates on the telephones in the business houses to $3. The residence rates of this company have not been changed since until the notice was received October 1.

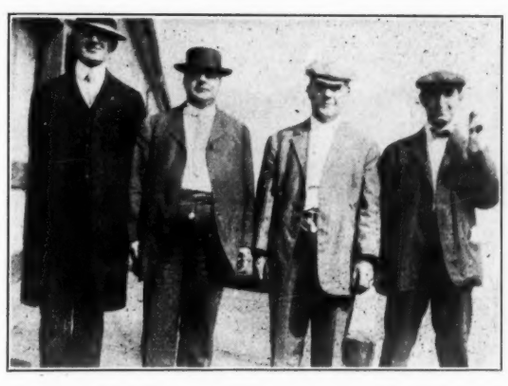
In speaking of the situation Mr. Roberts says: "The rates of our company for the business house, $3, office $1.50, and residence $1, are the same. We have been justified in the installation of our new central energy switchboard and other improvements by the increase in our patronage. We received in two hours orders for fifteen or twenty new telephones and our forces are kept busy. We have on hand probably only a half hundred more of the central energy telephones, but propose to take care of all of the business with which we are favored, and are giving our subscribers satisfactory service—one that cannot be surpassed by any city the size of Abilene. We expect that we will be compelled to install some of the old telephones, but these are to be replaced by new ones as fast as they arrive. We have at the present nearly 600 subscribers."

Another instance of the trouble in which the Southwestern Bell finds itself is the filing of a suit against that corporation and the Southern Telephone and Telegraph (Bell) Company by District Attorney H. B. Means of Hot Springs, Arkansas, alleging 600 separate violations of the anti-trust law and asking that penalties aggregating $3,000,000 be imposed. The complaint states that prior to May, 1905, the Southwestern corporation was the only one in the local field, and that shortly afterward the Southern was organized for the avowed purpose of competition and that it established a plant there. The state alleges that by means of this pretended competition, the company acquired several thousand new contracts and shortly afterward sold out to the Southwestern. It is claimed that was a ruse to defeat the law against pools, combines and trusts.

FOUR DISTINGUISHED VOYAGERS.

The steamer "Northwest", the biggest on the Great Lakes, fortunately suffered no disaster when the four gentlemen seen in the accompanying illustration, were passengers aboard her at Cleveland. Had the craft failed to float the Independent telephone movement would have lost an important section for all the members of this quartette are prominent in the industry.

The picture, which was taken on the dock at Cleveland just prior to embarkation, shows (reading from left to right): George A. Briggs, Elkhart, Ind., president of the Chicago Telephone Supply Company; J. G. Ihmsen, Chicago, general manager of the American Electric Telephone Company and president of the Telephone Manufacturers' Association; Walter E. Doolittle, Lafayette, Ind., president of the Sterling Electric Company, and M. I. Berger, La Crosse, Wis., president of the Vote-Berger Company.

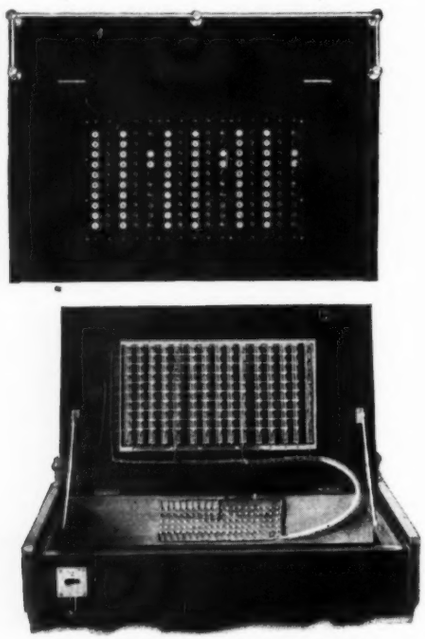


MANUFACTURERS DEPARTMENT

NEW CLEMENT-AUTOMANUAL SYSTEM.

The Clement-Automanual telephone switchboard, hereinafter described, is an invention developed in the past five or six years by Edward E. Clement, electrical engineer and patent expert of Washington, D. C.

Mr. Clement is comparatively a young man, thirty-nine



Clement-Automanual switchboard.

years of age, born in New Jersey, of German and English parentage. He was educated in the public schools, the United States Naval Academy, and Law School of the National University. His time prior to 1890 was spent in acquiring his education, three years of this period being spent in general engineering, and two years in the office of Maclay & Davies, New York. In 1890 he was appointed in the United States Patent Office as an examiner and assigned to the class of hydraulics for one year and then transferred to the electrical division, remaining there until 1898, his work covering all classes under telephony, telegraphy, electric lighting and signaling. For several years Mr. Clement had exclusive charge of the branch of telephony.

He studied law while in the patent office, graduating with honors in 1893, being admitted to the bar in the same year. In addition to his regular work he served as a member or chairman of a number of committees appointed by the secretary of the interior to pass upon technical matters, including telephone systems built for the Interior Department at Washington. He resigned from the government service in 1898 and entered private practice, forming a partnership with William D. Gherky of the Philadelphia Traction Company. This partnership was dissolved in 1900, since which time he has been connected in one way or another with the various electric manufacturing companies, and especially with Independent telephone development, has been and is connected professionally as attorney or engineer, or both, with many of the large Independent telephone manufacturing companies and many other electrical manufacturers and operators. After he had developed the scope of his automanual inventions, Mr. Clement laid the entire proposition before James B. Hoge, of Cleveland, Ohio, who organized the National Engineering Corporation for the purpose of systematically developing this system which would give better and quicker service to the existing exchange companies without the necessity of making a radical change in their outside construction work. This company was organized under the laws of the District of Columbia, and a number of the prominent operating telephone men were brought into it. A laboratory was opened in Washington which a little later resulted in establishing a factory in Baltimore, where machinery was installed and the business of manufacturing carried on. During this period of development the entire matter was kept secret, and in this issue of TELEPHONY appears the first authorized announcement relative to the automanual. The policy of the corporation has been all along to complete the system and place it upon a sound commercial basis before making any public claims. This having been accomplished, the officers of the National Engineering Corporation, realizing that their factory in Baltimore was not properly located to handle this business, and after carefully canvassing the field for a suitable connection in order to insure successful manufacture and in-

Charles H. North.

Edward E. Clement.

James B. Hoge.

stallation, completed on August 1 last a consolidation with the North Electric Company of Cleveland, bringing to Cleveland the Baltimore factory and giving the North Electric Company complete control of the United States and Canadian patents. The North Electric Company has been making telephone equipment for over twenty years, and the Clement-Automanual added to its regular line puts it in the field prepared, it feels, to not only make a specialty of that equipment, but to compete for any type of apparatus which operating companies may desire.

Since effecting this arrangement a contract has been made for the installation of an automanual switchboard at Ashtabula, Ohio, which will be put in operation early next year. Charles H. North, president, and George C. Steele, secretary and treasurer of the North Electric Company, need no introduction to the citizens of Cleveland and the telephone trade. James B. Hoge, who has recently been elected vice president, is one of the best known men in the telephone field, having been prominent in the work for the past ten years, three years of which time he was president of the International Independent Telephone Association.

The Clement-Automanual system is, in fact, a combination of the two old types—manual and automatic. It employs certain standard parts taken from the manual systems, and certain standard parts taken from the automatic systems, eliminates, it is claimed, all undesirable features of both systems, makes each part do only what it is best fitted to do, and as a result is said to give better service than heretofore possible, with greatly reduced operating expense. The actual saving effected in operators alone is claimed to be from forty to eighty per cent. Following will be found a description of this new apparatus furnished TELEPHONY by its manufacturers:

The Clement-Automanual equipment consists of an automatic switching outfit at the central office, operated by operators. The necessity for a subscriber's dial or "sender" is thus done away with, and the sub-station telephone is reduced to its ideal form, which is that of the ordinary standard common battery instrument used in all manual systems, but never heretofore in any automatic system. The subscriber's station, his line to the central office, and the line connections on the main frame, with their protective devices, are absolutely the same as in all standard common battery systems. The differences are within the main frame at the central office, the automanual equipment being substituted for the ordinary switchboard.

A complete Automanual equipment is divided into two parts, viz., the operator's equipment (consisting of keys only) and the automatic switching apparatus. Each operator's position is equipped with controlling keys somewhat similar to those of a typewriter. Each key set enables the operator to take and dispatch one call at a time, and becomes available for another call as soon as the first call is sent through. There are only "A" operators. The system does not employ "B" or trunking operators. There is no delay due to repeating of numbers for another exchange, nor to selecting or ordering up idle trunks, nor to any of the numerous causes which have heretofore contributed to delay, increased the percentage of errors and added to the expense of connecting stations through different exchanges. The switch and relay equipment takes care of inconing and outgoing trunk calls without any thought on the part of the operators or subscribers. The arrangement permits of any desired scheme of numbering in a multi-office system. All of the telephones in the entire system may be numbered in one series, or if desired, various exchange names or letters may be used. This statement also covers the selective party line telephones. The exchange manager may number, letter or otherwise designate his party line subscribers in any manner he sees fit. The apparatus is adaptable to any system of designation without exception.

A subscriber calls by taking down his receiver. He is instantly connected to an idle operator. Incoming calls are distributed among the operators, and as the number of operators is increased or decreased, the distribution adjusts itself to meet the varying conditions. When only one position is in service all calls come to that position. The operator seeing the signal on her idle key set, takes the number and sets it up on the keys. Her work on that call is then finished. She pays no further attention to it, but if other calls are waiting, she is free to attend to them. Her sole function is to take numbers and set them up. If the subscriber wants a long distance or toll connection, or to make a complaint, or to ascertain a number, or to state any want whatever, the operator adheres to her function, and merely sets up the keys so as to put the subscriber through to the person or department who can satisfy his want. A number having been set up on the keyboard, the switches commence to operate, and through successive steps, automatically taken and directed, the line corresponding to the number set up is selected and tested, and if found idle, the subscriber is rung in the usual manner. If he is a party line subscriber, current of the proper frequency is selected or the proper combination of circuits is made, so as to call him selectively. If the line is busy, the calling subscriber is automatically notified of the fact, as he is also if the wanted subscriber does not answer. Every contingency met in actual practice is provided for, and the system is so flexible, that any step or function which can be performed in either a full automatic or a full manual system, can be performed more easily, more quickly, more economically, more efficiently and with a lower percentage of error.

As soon as the switches have selected the line wanted, the particular operator's key set which was temporarily employed to handle the call, becomes disconnected, and all the operators are locked out during the continuance of the conversation between the subscribers. Absolute secrecy is thus insured.

The talking circuit, during conversation, is clean and clear, being essentially a duplicate of the standard, bridged, battery circuit employed in the most modern manual systems. What may be called double supervision or control is effected, whereby the calling subscriber can clear out, at any time, before the called subscriber answers; and after that, the called subscriber can disconnect his own line. It is thus impossible to tie up a line, either accidentally or maliciously.

When the subscribers have finished their conservation and hung up their receivers, all the connective apparatus between their lines is instantly cleared out and restored to normal condition, ready for use by other lines. This instantaneous clearing out not only enables the lines to call and be called again without delay, but effects an actual economy in apparatus and cable. This is especially noticeable in trunking between exchanges, where from five per cent to ten per cent may be saved with the same efficiency, or a corresponding increase in efficiency attained with the same cable over the best manual systems.

In making a recall, the subscriber simply hangs up his receiver and immediately takes it down again, or he may depress the switch hook a moment with his finger. This clears out the existing connection, and when the hook rises it puts the line again on an idle operator, who may or may not be the same operator who made the preceding connection.

The equipment and operation of the chief operator's monitor's, wire chief's and other auxiliary desks or positions are in accordance with standard practice. There is a considerable gain in efficiency as well as in economy in these positions because of the reduced number of operators and the reduced amount of equipment required. The design of the switches and relays, and the methods of mounting them, result in a great saving of space in the

switch and power room, for the operating room the space required is also greatly reduced. All the operators for a 10,000-line exchange can be accommodated in a room 25 by 30 feet and smaller exchanges in proportion.

Where numbers are changed, telephones disconnected, or other contingencies arise which on a manual board are indicated by colored pasters or change plugs, the automanual equipment automatically provides for them with perfect certainty and no trouble.

It should be particularly noted that there are no cords or plugs in this system. The talking connections are not made through the operator's equipment, but are only initially controlled thereby, and are thereafter under the control of the subscribers themselves, the same as in a full automatic system. All calls, in a properly handled exchange equipment of this type, should be answered instantly, and the average time consumed by the operator in taking a number wanted from the calling subscriber, repeating the number and pressing the corresponding keys, is 2.9 seconds. Working continuously, therefore, each operator could handle more than 1,200 calls in an hour. Allowing for lost time, however, and for slowness of subscribers an experienced operator, with this equipment should handle 800 calls per hour, and an ordinary operator at least 600. On this basis a 10,000-line exchange can be handled by from seventeen to twenty-five operators, and smaller exchanges in the same proportion."

Summing up the following are the chief advantages claimed for the new Clement-Automanual apparatus:

From forty per cent to eighty per cent saving in "A" operators' salaries.

One hundred per cent saving in "B" operators' salaries and reduced maintenance charges, due to simplified apparatus.

Quick, accurate service, secret service as well as absolute control of connections by subscribers. No interruptions during conversation.

Quick trunking service, operators' duties simple and easily learned, and no students' board required.

No grounds or complicated sending devices at the subscribers' stations, and any standard common battery telephone can be used.

Automatic ringing; saves time and labor; insures uniform ringing throughout the service; also prevents one subscriber tying up lines of another by not ringing after getting connection.

The operator cannot show favoritism to particular subscribers, as she never knows who originates any call. A subscriber's call may be answered by any operator in the exchange.

Called subscriber can release his line when called by undesirable parties, by simply hanging up his receiver.

Expensive and special frame work for switchboards is not needed. The operators' desks are of very simple design and can be standardized.

The distribution of calls among the various operators is uniform at all times. As the load decreases, and as the operating force is reduced, the calls are distributed among the remaining operators.

No patrolling of the switchboard at night or on Sundays or holidays is required, all calls come to the desk or desks in service, and the talking circuit is clear and well balanced.

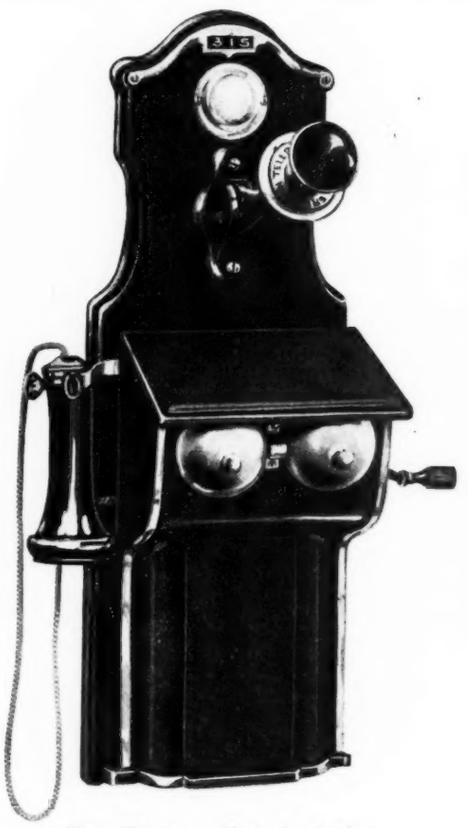
The North Electric Company will be glad to furnish every interested telephone man with full description and illustrations of this new apparatus of which so much is expected. A special bulletin concerning same is now ready for delivery.

CENTRAL ELECTRIC'S NEW PRICE LIST.

The Central Electric Company, of Chicago, Ill., is mailing out to the trade a price list, dated October, 1907, which applies to the company's 1906 and 1907 general catalogue No. 24. This price list has been revised to date and contains the very latest market figures in force at this time on all electrical appliances shown in the company's catalogue. It will therefore be of considerable interest and benefit to all purchasers of electrical material and the company requests that all holders of their catalogue who have not received a copy should write for one. In the back of the price list considerable space is devoted to the Western Union steel bracket which is intended to replace the ordinary oak brackets. Attention is also called to the Central Electric Company's fixture department, and a cut of a very attractive reading lamp is shown. The company states that this department is carrying a large assortment of the most up-to-date lamps and lighting fixtures and will be glad to submit designs and quotations upon request.

THE "NEW ERICSSON" ALL STEEL TELEPHONES

The L. M. Ericsson Telephone Manufacturing Company of Buffalo, N. Y., enjoys the marked distinction of placing on the market the first, full-sized, all-steel telephone. The



New Ericsson all-steel telephone.

accompanying illustration is that of the new "New Ericsson" equipped with adjustable arm and receiver.

The manufacturers claim for these telephones that they have more attractive features than any before placed on the market, including the following: that they are inches smaller than any telephone manufactured to-day, which boasts of full equipment and which provides space for two standard dry batteries; that the cabinets are drawn from No. 16 gauge sheet steel and the parts firmly riveted together, forming a cabinet which will not bend, warp, split or crack and which is practically indestructible; that all equipments, both magneto and common battery, are housed in identically the same size and style of cabinet; that this feature is one which cannot be duplicated elsewhere; that it is conducive to standard equipment since every telephone on the system will look exactly the same, and when the often desired change from magneto to common battery system is made, no change in cabinets is necessary, as upon the removal of

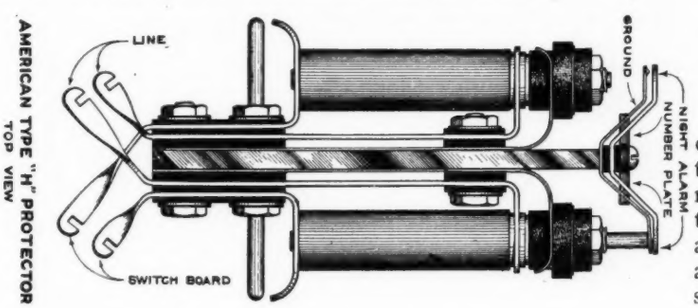
the magneto parts common battery equipment may be installed.

There are no exposed wires in this new Ericsson apparatus and all terminals and binding posts are concealed. This insures the instrument against tampering of any kind. Though small, compact and having all circuits concealed, the removal of the whole front of the cabinet exposes all working parts to the "trouble man," making it unnecessary to remove the telephone from the wall. The lightning arrester is entirely enclosed in steel, thus preventing fire from lightning discharges and high tension currents. All wires are very heavily insulated and protected by heavy rubber bushings where they pass through the cabinet to prevent short circuits. Laboratory and service tests have proven that enamel applied directly on steel will chip, crack and peel off when dampness causes the steel to rust. In order to prevent this in these cabinets, they are heavily copper-plated before the enamel is applied. Three coats of the highest grade enamel are separately baked on and each is applied by "dipping" which insures a uniform, beautiful and lasting finish. Nickel trimmings are used throughout and all are covered with a transparent lacquer to prevent tarnishing. The contrast between the nickel and enamel is beautiful and must be seen to be appreciated.

In summing up, it is claimed that every line of the cabinet is graceful and the completed instrument is not alone the first of its kind, the smallest and the most beautiful, but the most economical telephone ever constructed. Interested parties are requested to write "Department D" for "Booklet B," which is devoted entirely to these all steel telephones and which contains cuts, descriptions and list prices of all equipments, both magneto and common battery.

THE NEW PROTECTOR, "TYPE H."

Recent reports from the American Electric Fuse Company show that its type "H" main office protector is meeting with great favor throughout the Independent telephone field. In the course of three months the company has secured orders for over 40,000 pairs of this protector, and numbered among the exchanges which have adopted it are some of the largest in the business. The company is especially proud of the Detroit contract where 20,000 pairs are being installed in the main office and three branch exchanges.



Sectional view type "H" protector.

The claims made for this protector by the American Electric Fuse Company are that it is smaller in size, and is therefore easier to work upon; that there is perfect alignment given as there are three studs to hold each pair of springs; that it is not necessary to employ tools when inserting or removing the heat coil, and that when the heat coil is removed all operating parts are out of the line. Special attention is called to the position of the ground and local alarm springs. They are right in the front where they can be adjusted and worked upon without having to disturb the subscriber, whereas, in most other makes, the locals are down in between the line springs and have to be taken apart in order to be gotten out. The maintenance on this protector, the American company claims, is far below that of any other protector which has yet been produced and this is brought about on account of it's construction and general lay out.

The cut shown here is a sectional view, actual size, and gives an idea of what the type "H" protector consists of. Catalogue No. 31 gives a full and complete description of this line of material and will be gladly forwarded on request.

MEASURED SERVICE.

The Dean Electric Company has the following to say regarding its new telephone meter:

While Independent operators generally find it to their advantage to sell unlimited flat service, there are some circumstances which compel the sale of service according to the number of connections made. Efforts to establish this method often result in serious controversies which go far to prejudice subscribers and prospective telephone users against the operating company, and such disputes usually arise from the fact that the service records are not so simple and accurate as to be beyond doubt. By the use of such systems where the operator records the charge, the subscriber is in the dark concerning the status of his account (until he receives a statement), unless he also makes a penciled record after each call. This is a serious inconvenience to the user, and is not conducive to prompt collections, as any forgetfulness on the part of the subscriber will form the basis for a long controversy with the collector.

Dean's new telephone meter.

With the intention of supplying Independent operators with such a device as will enable them to furnish better measured service than their Bell competitors, the Dean Electric Company has perfected its "Type C" service meter. This device is mounted in an extended portion of the transmitter shell, and gives a distinct signal to the operator, upon making a registration. The counter is located in plain view of the subscriber just below the transmitter mouthpiece and is operated by a slight pressure of the thumb.

No special transmitter or peculiar circuit is necessitated and the location of the meter in no way interferes with the customary method of using a desk set or wall telephone. The ready adaptability of this device to all kinds of service,

magneto or common battery, is one of its particularly attractive features, explained in the new Dean folder, No. 14.

PEIRCE SPECIALTY CO.'S NEW BRACE.

It is a significant fact that when engineers design a bridge they specify angle and channel steel. Couldn't flat bars be used instead? Why, certainly, but how about strength? Ah! there's the rub. Why, then, is the average telephone manager trying to get along, using flat bar iron for his back braces? When the sufficient strength of brace is secured, the weight is so excessive that it runs the cost up beyond the average telephone company's ability to pay; consequently they endeavor to get along with a lighter brace of insufficient strength.

The brace illustrated here has recently been put on the market by the Peirce Specialty Company, of Elkhart, Indiana. It is made of channel steel, thoroughly galvanized to stand the most rigid tests and is very strong, at the same time being very light. A one-inch channel back brace has a little more strength than a 1¾-inch flat brace and weighs only three-fourths as much.

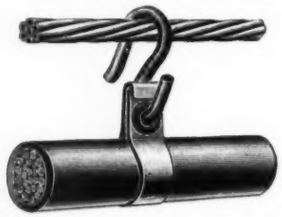
This new brace has pointed lugs thrown out on its inner surface, which press into the pole at the center and into the cross arm at each end, effectually preventing creeping and vibration. The company invites correspondence concerning this new article.

Peirce Specialty Company's new brace.

THE NEW "I-LET" METALLIC CABLE HANGER.

The Yonkers Specialty Company of Yonkers, N. Y., manufacturer of the well-known Metropolitan cable clips, has placed on the market a new hanger known as the "I-Let" metallic cable hanger. This hanger has a hook quite similar to the "S" hooks commonly used with marline hangers, and is offered at marline prices.

The Yonkers Specialty Company has had a large experience in the manufacture of all kinds of metallic hangers, but has never before offered a metallic hanger to compete in price with the old-fashioned marline hanger. Marline, of however good quality, does not last at all well in some climates, it is said. In the "I-Let" hanger a zinc strap is substituted for the marline, which metal has proved, it is claimed, to be the most durable and satisfactory for this class of work. The holes in the zinc strap for the insertion of the galvanized "S" hook, are reinforced by brass eyelets; hence the name given to this hanger.



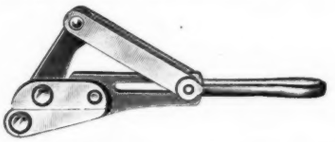
Yonkers "I-let" cable hanger.

Aside from its durability, which is, of course, an important feature of any aerial cable hanger, the metallic hanger affords protection to a lead aerial cable from two important sources of danger, it is claimed, namely, from lightning and from high tension crosses. Many construction superintendents, whose experience has been limited to marline hangers may receive this statement with incredulity. It is a fact, however, so the Yonkers Specialty Company states, that by having an intimate metallic connection between cable and supporting wire, and by grounding the latter at frequent intervals, the damages resulting from lightning and electric light wires are localized instead of scattered throughout the cable, and therefore the maintenance expense from these causes is greatly reduced. In other words, a good metallic connection between supporting wire and cable, and between both of these and the ground, is much better than the imperfect insulation afforded by marline or any similar material. It is said that the maintenance records of telephone companies, which have abandoned marline for metallic hangers, will prove this claim.

To those who are willing to investigate these facts for themselves and who have heretofore hesitated to use metallic hangers on the ground of expense, the "I-Let" metallic hanger should prove interesting.

KLEIN'S NEW "CHICAGO GRIP."

Mathias Klein & Sons, Chicago, known everywhere for their reliable construction tools, are introducing their latest specialty, styled "the Chicago Grip." The new grip is made of steel throughout, and nickel plated. It is well proportioned, light and just the right shape to handle quickly. When placed on the wire it will hold itself in place. It can be pushed out on the wire, so as to get as much slack as necessary, and it pulls straight, leaving no kinks. It is said to cover all the essential points required of a grip to do good work on either iron or copper wire. No. 358-A holds No. 6 wire and smaller. Net price and full information can be had on application.



COOK SELF-WELDING WIRE JOINT.

Frank B. Cook announces that he has succeeded in perfecting a "wire joint" for splicing both iron and copper wires which is mechanically and electrically perfect. He further claims that he has demonstrated this fact to the satisfaction of some of the largest users in the country as well as to many noted electrical engineers. The construction of the sleeve, or joint, is, in itself ,a simple device to look at, but its success is due to its peculiar design and care in its manufacture.

Referring to Figure 1, it will be noted that one side is flat and the other is formed to fit the wires. In twisting, the flat side is drawn up into the recess between the wires and meets the upper or formed side, stretching the metal around the wires so tight as to completely close up any space and make a perfect cold weld between the metal in the joint and the wire. It is only necessary to use the ordinary splicing tools and the mere act of twisting the joint makes a connection that is air and moisture proof—the ideal electrical splice.

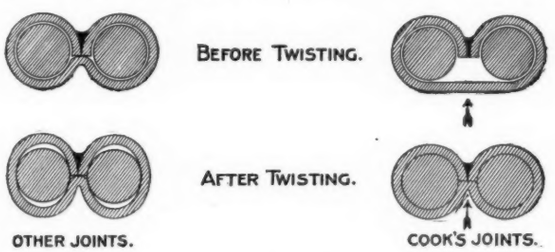


Figure 1.

The early method of making a splice was to twist the wires together and solder the joint. After a time, this method was replaced to a certain extent by inserting the wires together. This later method gave moderate satisfaction in splicing copper wires, but in splicing iron wire

many of the large users decided to return to the old manner of twisting and soldering, even though more expensive than the sleeve, their reason being that they could not depend upon the joint made with the new sleeve. Moisture penetrated, setting up corrosion, causing high resistance and the joint thus made was weak. Having these objections in mind, Mr. Cook so constructed his sleeve as to retain the strength and other desirable features of the twisted and soldered splice and produce a sleeve which has maximum strength and efficiency combined with minimum labor in application. A comparison of the efficiency of this joint, as compared with other types, is best shown by referring to Figure 2, in which *B* is a Cook No. 10 joint with one No. 10 and one No. 12 wire, and *A* and *C* are other No. 10 joints made up under the same conditions. This illustration is a reproduction of a photograph which has not been retouched. The upper portion of each sleeve or joint was filed away to show the interior of the joint. This illustration also shows that the Cook sleeve may be used as a combination joint with perfect success, which feature is of considerable value, as it means less variety of sizes in stock for the consumer.

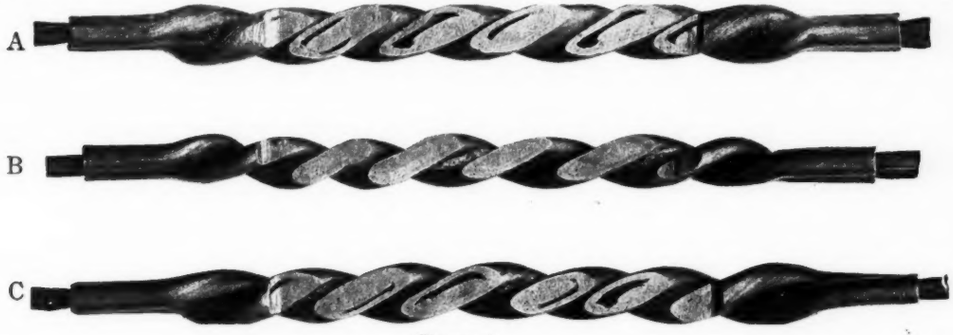


Figure 2.

The strength of the Cook joint has been thoroughly demonstrated, it is said, but the following claims may be of interest: The joint is positively stronger than the wire. It will stand several twists in addition to the three and one-half twists used in common practice without fracturing and, in fact, it can almost be tied into a knot.

Mr. Cook announces that the Western Union Telegraph Company has adopted his joint after exhaustive tests and incidentally exhibits an initial order for 500,000, also a recent order from the Australian government and an "eye opener" from Japan, demonstrating that the Cook joint is used on telegraph, electric light and power circuits with perfect satisfaction, as well as in telephone construction.

Mr. Cook has an interesting little circular on this joint which he will mail to any interested party upon request.

The Cook joint is made in all sizes and the name is "Cook Self-Welding Wire Joint." Memorize it.

ILLUMINATED TELEPHONE SIGNS.

Progressive telephone managers are coming to appreciate more and more each year the value of increasing the earning capacity of each department to its limit. The toll business in particular has been an important feature of the Independent field within the past few years and one to which special emphasis attaches to-day.

The Independent shield signs have become enormously popular, as heretofore manufactured chiefly in enameled steel and we now have a very interesting adaptation of the same principle, and one which should prove equally profitable for Independent companies, in the illuminated signs manufactured by the Solar Electric Company, Chicago, Ill.

These signs are, of course, designed to attract the attention of parties who might have occasion to use long distance lines at night. They consist of a heavy frosted glass globe, canteen-shape, covering the ordinary 16-candle-power electric light and is especially adapted for use in public places such as hotel lobbies, cigar stands and other points where toll business ordinarily originates. There are three sizes of these signs now being manufactured, the smallest being 8 inches in diameter, the intermediate size 10 inches and the largest, or "Mono," 16 inches. This latter sign has but recently been brought out and is designed particularly for outdoor use, in front of pay stations.

The Independent shield in colors is shown upon one or both sides of these signs, as may be desired, and they are equipped with or without flasher effect.

The "Mono" signs also can be attached in either a vertical or hanging position or can be purchased with a "gooseneck" attachment. The Solar Electric Company has sold a large number of these signs to many of the large telephone companies and they are said to have invariably given excellent satisfaction. They are not affected by weather conditions, having special waterproof steel holder which prevents admittance of moisture.

Solar Electric's telephone sign.

The Solar Electric Company is the sole manufacturer of this very attractive specialty and will be glad to furnish particulars upon request.

AN IMPORTANT CONSOLIDATION.

The American Automatic Telephone Company, of Rochester, N. Y., has purchased the Select Telephone Manufacturing Company, of Springfield, Ohio, and both companies will be moved, about the first of January, 1908, to Urbana, O., where twelve acres of ground has been bought for a new factory, and work has already commenced on the construction of same. The new factory will be located close to all of the city's railroad stations, namely: the Big Four, the Erie and the Pennsylvania. The Automatic company recently has received several large contracts for equipment, including Indianapolis, Urbana and Kenton, and work is already under way.

The officers of the company are: President, James S. Brailey, Jr., Toledo; vice-president and general manager, J. W. Lattig, Rochester; secretary and treasurer, B. J. Williams, Rochester; assistant treasurer, S. B. Grove, Urbana; directors, the officers named and C. D. Juvenal, Springfield, O.; Charles H. Marvin, T. E. Dye and George W. Hitt, Urbana; H. H. Stebbins, Jr., William H. Hutchinson, George R. Raines and Joseph R. Webster, Rochester, N. Y.

H. R. SYKES TO SELL "EASOPHONES."

H. R. Sykes, general manager of several Independent telephone operating companies in Ohio, will join the sales organization of the Wire & Telephone Company of America during the current month. Mr. Sykes' long experience in the telephone field should prove a valuable asset, enabling him the better to convey his impressions of the excellence of the "Easophone" equipments to exchange managers and subscribers. "Easophone" equipments and the same firm's telephone wire and supplies are being used so generally that it has been necessary to materially enlarge the sales organization of this progressive company.

TRADE NOTES.

ROTH BROS., Chicago and New York, exhibited at the Electrical Show, Madison Square Garden, New York City, from September 30 to October 9.

DINSMORE & LAWTON, 118 West Jackson boulevard, Chicago, represent the Sandwich Pole Changer Company in that city and carry a full stock of pole changers on hand for the trade.

THE C. A. MANUFACTURING COMPANY, Austin, Texas, has prepared an illustrated booklet, descriptive of its "C. A. Wood Preserver," and will be pleased to send same to all buyers of poles, pins, cross arms, brackets, etc.

W. N. MATTHEWS & BRO., of St. Louis, have published a vest pocket booklet, containing specifications for splicing Hargis joints in telephone cables. The book is well illustrated and full of useful matter. Sent free to interested parties.

THE VOTE-BERGER COMPANY, LACROSSE, Wis., is distributing a neat advertising novelty consisting of a dice box having a celluloid cover bearing the Vote-Berger designs advertising the D. & T. anchor and the two-ball adjusters for incandescent lamps.

THE NATIONAL POLE COMPANY, Escanaba, Mich., is sending its customers a very handsome souvenir in the shape of a bronze paperweight in the form of a carload of poles. The souvenir is most unique and makes a fine ornament for any desk.

A NEAT BOOKLET, treating of "Requirements for Efficient Telephone Train Dispatching," has recently been issued by the Blake Signal & Manufacturing Company, 246 Summer street, Boston, Mass. Free copies will be promptly furnished to all interested parties.

E. A. VROOMAN, OF SCHENECTADY, N. Y., has assumed the duties of advertising manager of the L. M. Ericsson Telephone Manufacturing Company, Buffalo, N. Y. Mr. Vrooman is well known as an efficient advertiser, and will no doubt enjoy excellent opportunities in his new position.

THE MASSACHUSETTS CHEMICAL Company, of Waipole, Mass., exhibited at the American Street & Interurban Railway meeting at Atlantic City, October 14-18. Messrs. A. T. Baldwin, L. O. Duclos and A. E. Duclos represented the company with a full line of samples, descriptive literature and souvenirs.

D. C. AND WM. B. JACKSON, engineers and experts, announce that they have removed their western office from Madison, Wis., to the Commercial National Bank Building, Chicago, and have opened an eastern office in Boston, Mass. William J. Crumpton will be in immediate charge of the Chicago office.

THE PREMIER ELECTRIC COMPANY, 56-58 West Van Buren street, Chicago, has issued a new bulletin, No. 7, in which will be found many items of interest to telephone buyers. The Premier company will continue to specialize in rebuilt telephone apparatus, which it claims to overhaul and make as good as new, and it also will handle all telephone parts, new telephone equipment and telephone supplies. The man who wants to save money and at the same time secure reliable stuff is invited to address the Premier Electric Company as above.

THE DEARBORN ELECTRIC COMPANY, Chicago, reports many increased sales on its telephones, due to their high quality and low prices. The Dearborn telephone catalogue contains a most complete list of telephones, telephone supplies, construction material, etc., and will be sent to anyone in the trade upon request.

THE F. BISSELL COMPANY is issuing a post card to the telephone trade setting forth the merits of the "American Electric," or Phillipsdale, wire, and calling attention to the fact that it claims this wire is superior to others although selling at no higher price. The Bissell Company is backing up this statement by offering to demonstrate at no expense to the consumer.

THE DIELECTRIC MANUFACTURING COMPANY, of St. Louis, has issued a bulletin giving a large number of curves showing the dielectric strength of various insulating materials under normal and other conditions. The pamphlet includes a talk by J. J. Kessler to the salesmen of one of the companies handling Dielectric products, which is a model of commercial exposition of a technical subject.

THE STUART-HOWLAND COMPANY, of Boston, has fairly outstripped even its own very excellent standards in its new, illustrated catalogue of electrical supplies, No. 3. There are about 800 pages in this very complete book. Fine paper is used and the binding is neat and substantial. Almost everything that is latest and best in telephone and electrical apparatus and supplies is listed, illustrated and described.

THE INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, of Chicago, reports a constantly increasing demand for its four-party magneto-call local battery telephones. These instruments, it is said, are especially adapted for four-party selective ringing lines where long-distance service is required, they being equipped with the well known International loud speaking transmitter and receiver.

THE ELECTRIC SERVICE SUPPLIES COMPANY, Chicago, Philadelphia and Keokuk, Ia., carries in stock, for immediate delivery, a full line of tools such as are used in handling and erecting telephone poles. These include the best grades of shovels, spoons, pole supports, cant-hooks and carrying hooks. It lists all this material with prices in a catalogue which will be sent to managers and construction superintendents upon receipt of a request.

THE BLAKE SIGNAL & MANUFACTURING COMPANY, Boston, was represented at the American Street & Interurban Railway convention at Atlantic City, October 14 to 18, inclusive, by E. J. Burke, C. C. Blake and George S. Hastings. The company had a complete working exhibit of standard signal apparatus, together with a trained and competent train dispatcher, various types of railway telephones and standard blanks, etc., for telephone train dispatching.

THE TELEPHONE APPLIANCE COMPANY, Minneapolis, Minn., has brought out a number of very clever construction specialties which are intended to fulfill economically all practical requirements. An example is the "Yankee" seat, already in use by many companies, while another is the Gregory circle top. The company also manufactures a

line of pole fittings and distributing apparatus covering a considerable variety of types and will be pleased to furnish full information concerning same to interested persons.

THE NEW CATALOGUE OF THE H. H. Franklin Manufacturing Company, Syracuse, N. Y., describes the Franklin "die cast part," referring especially to the special features of the Franklin metal or alloy from which may be made castings so smooth as to require no subsequent finishing. For a considerable variety of small parts of telephones and telephone apparatus such castings have been used with marked success and as they can be made with holes, slots, lugs and spurs all cast at a single operation, the saving in cost is considerably over that of similar parts which have to be cast rough and machined afterwards.

THE BELDEN MANUFACTURING COMPANY, of Chicago, which makes a specialty of magnet wire, electrical cordage, German silver resistance wire, cotton sleeving, rosin core solder, and office and annunciator wire, and winds small coils and magnets to order, also has a special engineering department for the purpose of solving problems in winding. Naturally, a corps of specialists of this kind is exceedingly valuable, as their services are available at short notice at any time by telephone or other companies beset with problems which transcend the understanding of the man immediately in charge. Cases do happen where expert advice must be had at once, and it is this kind of cases that the Belden company is prepared to cope with through its expert force.

THE INLAND TELEPHONE & ELECTRIC COMPANY, St. Louis, reports a prosperous season and growing business. This company was organized December 1, 1906, by J. A. Becker, who has been in the Independent telephone manufacturing business since 1895, starting with the Central Telephone & Electric Company, where he held the position of superintendent for seven years. Mr. Becker is president and general manager of the new company and is well known throughout the telephone field. The Inland Telephone & Electric Company already has established a reputation for turning out high-grade telephone apparatus and switchboards. A catalogue, illustrating and describing its telephones, switchboards and other apparatus, will be sent on application.

THE NEW HAVEN MACHINE SCREW COMPANY, of New Haven, Conn., has an announcement on the outside back cover of TELEPHONY which will interest many telephone manufacturers, supply dealers and operating companies. This concern also makes the celebrated "Reidy" climbers for linemen. P. J. Ring, superintendent, has been with Reynolds & Company and other screw manufacturers for nearly twenty years, while J. J. Reidy, sales agent, has been with Reynolds & Company continuously for over seventeen years, and is well known to most purchasing agents as their traveling salesman. The new concern's plant is now in operation and thoroughly equipped with the best modern machinery for the production of hexagon, square and round head cap screws, round and square head set screws, collar screws, studs and taper pins, and all other screw machine products turned from steel, iron or brass wire. The New Haven Machine Screw Company will guarantee the quality and workmanship of its products, and is in a position to make prompt delivery.

TESTS MADE OF INSULATOR PINS.

The West Virginia University recently completed a series of very interesting tests of insulator pins and wood preservers, manufactured by the Ohio Valley Bending Company, of Parkersburg, W. Va. The pins tested were received in two consignments, the first consisting of fifty-six 1⅛ inch shank pins of about equal numbers of hickory, elm, locust, beech and oak; also a number of pieces of stock about 1¾ inch square of the same woods. A part of this shipment was tested for the strength of the pins without further seasoning and without any special treatment. The second consignment consisted of one hundred 1⅛ inch shank and seventy-five 1¼ inch shank hickory pins. These pins were thoroughly seasoned in a dry kiln and then treated with various preservatives.

The results of the various tests are included under the following heads:

(1) Transverse tests of insulator pins.
(2) Flexure tests of stock sizes of various woods.
(3) Test to determine the amount of various preservatives absorbed by the pins with different methods of treatment.
(4) Test to determine the amount of water absorbed and retained by pins that have been treated.

Buyers of telephone supplies who will write the Ohio Valley Bending Company, mentioning TELEPHONY, will be furnished complete copies of the report on these tests and they will be found most interesting and profitable reading.

WIRE & TELEPHONE COMPANY'S INCREASED FACILITIES.

The demand for the wire and telephone products of the Wire & Telephone Company of America, of Rome, N. Y., in the south has made necessary the opening of an office to take care of it, and the Besco Supply Company, of Birmingham, Ala., has been appointed agent. A stock of bare and rubber covered wire, magnet wire, annunciator wire, and telephone apparatus will be kept there so as to take care of orders for immediate delivery.

The Wire & Telephone Company of America has recently started its new bare wire mill and the extension to its old insulating mill and telephone plants. The additional equipment gives this company a large capacity for all kinds of bare and insulated copper wire and telephone apparatus. Stocks are maintained at headquarters in Rome, N. Y., and with the company's agents, the Commercial Electrical Supply Company, St. Louis, Mo.; the Durant Electric Supplies Company, Chicago, Ill.; the H. I. Wood Electric Company, Louisville, Ky., and the Besco Supply Company, Birmingham, Ala.

LONG DISTANCE PHONOGRAPHY.

While the talking machine business has always been one of the branches of the electrical field, it has never been as closely associated with telephony as recently, since the introduction of the "telephograph" by the International Telephone Manufacturing Company, of Chicago. This instrument combines the telephone and the phonograph, and has created a new field for development. With this instrument the selections from one phonograph may be transmitted to any number of places, or to any distance over the ordinary telephone line. The transmitter is mounted directly on the reproducer of the phonograph, or on the horn leading from the reproducer. In series with the transmitter is placed a set of batteries of from 15 to 20 volts in circuit with the primary winding of a special coil of double winding. The secondary of the coil is connected direct with the line. Any number of reproducers with megaphone may be connected with the line in series, and the selections reproduced at the distant point or points, the same as if the megaphone were placed directly on the phonograph.

With this equipment Independent telephone companies can furnish music and other entertainment over their lines to public parks, amusement gardens, skating rinks, dance halls, or other public or private places of entertainment.

THE S. C. NO. 14 TYPE RECEIVER.

The all-rubber type receiver shown in the accompanying illustration is the latest addition to the Stromberg-Carlson receiver family. It embodies all of the excellent features of construction and quality characteristic of its other types,

Stromberg-Carlson all-rubber receiver.

with the addition of the permanent adjustment feature which has become standard with almost all manufacturers. The number of parts are comparatively few, the principal feature being the dome-shaped punching which supports the permanent magnet and the two magnetic coils of the receiver. The cores of the magnetic coils are automatically ground by machinery to an exact depth of .017 inch from the edge of the dome-shaped punching or from the inner surface of the diaphragm. This is one of the features of construction which makes every receiver sure of absolute adjustment. The most notable change in this receiver is a form of composition shell which has been altered slightly to incorporate the shape of the original Stromberg-Carlson receiver. It also has a strong ear cap with the name of the manufacturer cast upon it. This form of receiver is being furnished with all Stromberg-Carlson telephones unless otherwise specified, and although it has been manufactured for some months it has not been advertised until it was generally conceded to be the favorite by the users of S.-C. "quality" apparatus.

THE MOBILE HOME COMPANY.

The Home Telephone Company of Mobile, Tenn., has made extensive improvements in its plant and system during the last year, expending over a half million dollars. A new exchange building has been erected, modern in every particular, and of fire-proof structure. The Mobile Register gives the company a very complimentary write-up in a recent issue and calls attention to the switchboard and other equipment, which are entirely new and were installed by the Dean Electric Company, of Elyria, Ohio. Before the change to the new building the company had 600 subscribers and now has 1,400, with a constantly increasing list. The wires come into the building from the underground conduits in cables and passing through specially built enclosures in the basement and first floor, lead to the switchboard, which has an ultimate capacity of 6,700 subscribers.

In the improvements made the Home company put its wires underground all through the business district, as far west as Lafayette street, south to Monroe street, and north to Adams, the system being continued beyond those boundaries to the city limits by overhead wires. Copper wire is used throughout and the company has 11,000 miles of wire in the ground, in 290,000 duct feet of conduits, with 2,600 miles of wire overhead strung on new poles, the whole system being reconstructed.

A new and extensive set of lines has been constructed across the bay in connection with the Mobile exchange of the Home company. The lines cross Mobile river in a heavy cable at Magazine Point, are continued across the marsh land on creosoted poles, and cross the Tensas river at Blakely in another heavy cable. By means of this connection Mobile subscribers are enabled to communicate with Point Clear and other summer resorts in Baldwin county. The Home company will also have connection with the western long-distance lines when a gap between Mobile and Birmingham is filled, and local subscribers will be enabled to reach many distant cities over the wires of the Independent companies.

The company was first organized by Mobile men, but ouside capital was brought in to make the extensive changes and improvements of the past year, and the new officers of the company are as follows: W. C. Polk, president; W. H. Bryant, vice president and general manager; J. C. Monteith, treasurer, and R. L. Douglass, secretary. It is the plan of this organization to give Mobile first-class telephone service.

BALLAST BOARDS WINNING THEIR WAY.

The Vote-Berger Company, La Crosse, Wisconsin, reports a contract with the Home Telephone Company, of Dayton, Ohio, for a three-position, non-multiple "ballast" switchboard to be used at Miamisburg, Ohio. The Vote-Berger Company states that its "ballast" system is arousing more interest than ever in the telephone field, occasioned by the success with which the larger boards, now in operation, are working, and the company feels that the continued success of the "ballast" system is making the telephone world look upon it more and more as the most modern common battery equipment yet designed. This is further borne out by the decision of the primary examiner, Division 16 of the United States Patent Office, October 6, 1906, validating the patents upon the Vote-Berger iron wire ballast, which reads as follows:

"It has not been denied but that the device is simple and a material improvement in telephone systems. The arrangement is new, accomplishes a useful result in a new way, and advances the telephone system a step nearer its ultimate perfection."

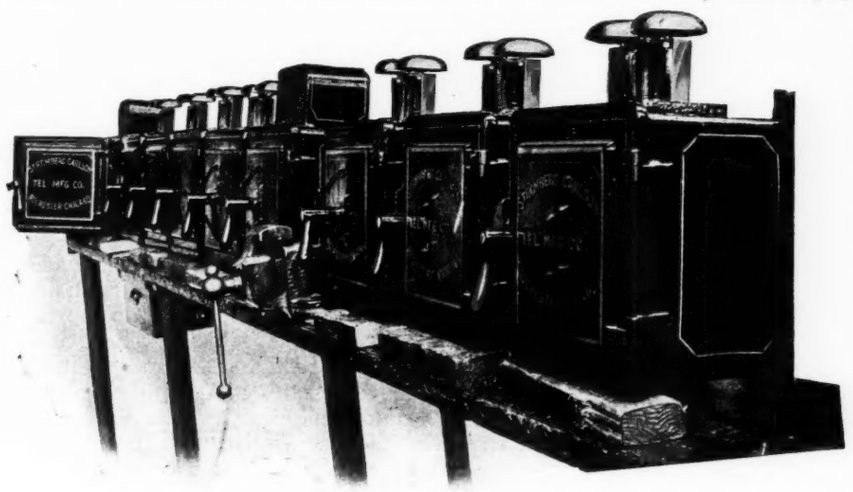
RECENT SWEDISH-AMERICAN SALES.

The Swedish-American Telephone Company has recently furnished exchange equipment for the following named companies: Browersville Telephone Company, Browersville, Ont., Canada; Waterford Telephone Company, Hagersville, Ont., Canada; Benson County Telephone Company, Minnewaukon and Mauson, N. D.; Panther Creek Telephone Company, Mayfield, Ky.; Farmers' Mutual Telephone Company, Oakland, Iowa (300-line switchboard and 400 exchange and rural line telephones); Wonewoc Telephone Company, Wonewoc, Wis.; Potter Telephone Company, Gettysburg, S. D.; Potter Telephone Com-

pany, Lebanon, S. D.; Potter Telephone Company, Blunt, S. D.; Dolton Telephone Company, Dolton, S. D. The Swedish-American company reports a bright outlook for increased business, and has enjoyed an unusual demand for its equipment during the summer months.

MINE TELEPHONES.

The iron-clad magneto telephone herein illustrated is a form of telephone not familiar to the majority of regular telephone users, being especially designed for use in mines and for despatching telephone systems operating a magneto call local battery system. The Stromberg-Carlson Telephone Manufacturing Company has been manufacturing a mine telephone for a number of years, but since the improvement and important changes made in its construction about the first of this year, its sales have considerably increased, amounting to an average of about fifty instruments per month. The case is built of cast iron and is designed to meet the conditions prevalent in mines where acid fumes and water are abundant and for outdoor service where bad weather and severe usage are common. It is absolutely



Stromberg-Carlson mine telephone.

water-tight and weather-proof. The outer door closes against a rubber gasket, rendering the box air tight and allowing it to be placed in exposed locations. The inner compartment contains the talking and signaling apparatus and is locked with a key, which is carried by the attendant responsible for the instruments. The strong, double-polarized ringer mounted in the dome on top of the telephone is thoroughly magnetic and constructed so as to withstand the maximum amount of moisture which can enter into this dome. It is equipped with cast bell metal gongs which give the loudest tone possible. The openings at each side of this dome permit this instrument to be heard at considerable distance.

These telephones have been installed at the end of breakwater wharves in the United States signal service system, where they are constantly subjected to moisture. All of the parts in these telephones are especially constructed for this service and brass is used almost exclusively, except where the material forms a part of the magnetic circuit. The latest type solid back transmitter and non-adjustable receiver is furnished with these instruments, together with standard bridging equipments; either four or five bar generators and 1,000, 1,600 or 2,000 ohm ringers. The manufacturers report a good distribution of these instruments in South American countries and especially in Mexico for use in various mines. They are also used to considerable extent throughout the United States for despatching systems on interurban railway systems.

BLACKBURN GROUND CLAMPS AT DETROIT.

Readers of this issue of TELEPHONY have no doubt been very much interested in the account of the new plant which has just been built by the Home Telephone Company in Detroit, Mich. In the construction of this most up-to-date plant the engineers have selected equipment of the best and most approved manufacture. The importance of a good ground connection is known by all telephone engineers and the fact that this company's engineers have specified the Blackburn ground clamp, goes far to verify the statement made by its manufacturer that it is the best and cheapest clamp made. This clamp was placed on the market three years ago and has been adopted by many of the largest telephone companies. Geo. R. Blackburn, Cleveland, Ohio, sole manufacturer, will be pleased to furnish samples and prices to all who are interested.

CENTURY'S RECENT ORDERS.

The Century Telephone Construction Company has been shipping a large number of switchboards recently, especially those equipped with their new self-restoring drop. The following is a list of switchboards recently shipped with telephones: Louter, La.; Sheldon Court, Ithaca, N. Y.; Binger, Okla.; Corydon, Pa.; Berlin Center, O.; Billings, Mont.; Steamburg, N. Y.; Springfield, Ont.

Magneto call switchboards were also shipped to: Edinburg, Ind.; New Houlka, Miss.; Springfield, Ont.; Calhoun, Mo.; West Bryant, Me.; Avard, Okla.

The installation of a common battery selective multiple lamp signal equipment has just been completed at Dunnville, Ont., and a magneto selective equipment is being installed at Caledonia, Ont., telephones being included for both of these exchanges.

Shipment will also be made immediately of a common battery selective multiple lamp signal switchboard and telephones to Charleroi, Pa., and a common battery lamp signal switchboard equipment to Holden, Mo.

The company also reports receiving an order for common battery lamp signal switchboard equipment and telephones from the General Railway Signal Company of Rochester, N. Y.

The Century Telephone Construction Company has also received an order from the Meadville Telephone Company of Meadville, Pa., for a complete common battery private branch exchange equipment including telephones.

PORTABLE LAMPS FOR HOLIDAYS.

The Central Electric Company, of Chicago, is sending out a "flyer" on portable lamps which shows some very attractive lamps as gifts for the holidays. The company has for some years devoted considerable attention to the fixture department and this year special attention has been paid to this branch and particularly to lamps. The Central Electric Company will gladly mail a copy of this "flyer" on request.

THE WILLARD STORAGE BATTERY PROSPERS.

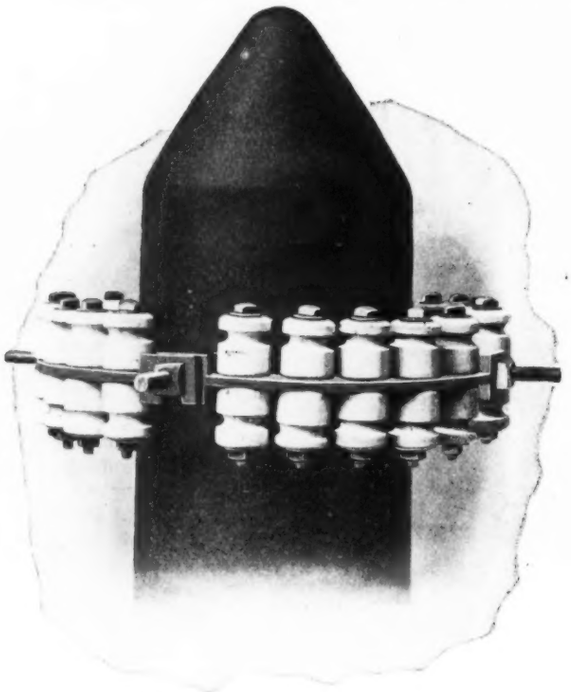
The Willard Storage Battery Company has recently removed to new quarters at Marquette and Lakeside streets, Cleveland, O. Here it will enjoy over three times its former capacity and will continue to vigorously push its line of storage batteries for all purposes. The Willard company has over 8,000 cells in use on one railroad alone, and it is said that its signal batteries are in use on practically every

railroad in the United States. The concern also makes batteries for many of the largest electric vehicle plants and is prepared to furnish complete installations for the better class of telephone companies. Full information and circular matter can be had on application.

CENTER BLOCK DISTRIBUTION.

Center block distribution has been figured on in a great many ways. There have been all kinds of distributing rings and all sizes. The American Electric Fuse Company has brought out a circle top made in two sizes, 20 or 40 pairs, which still can be utilized from 5 pairs to 40 pairs. It is designed to fit any size of pole and has one bolt which goes clear through, while the two side bolts lag into the pole about three inches, and with the adjustable nuts, can be regulated to fit any size of top.

The cut shows a section of a 20 pair circle and the front



Section of 20-pair circle top.

part shows the lap over of the two castings. The castings are made of malleable iron and so are strong and durable. Special steel bolts are used in this with bushings or gaskets on the end of the knobs so that undue strain is provided for. It is claimed for them that they are neat, convenient and a money saver and with these no platform is required. One man can put up an American circle top and do it with ease. A number of Independent companies have adopted this for block distribution and the American company would be very glad to furnish descriptive matter on this line on receipt of postal.

SKELLEY TELEPHONE HOLDERS.

The Skelley Manufacturing Company, of Cleveland, O., is arranging to move into a handsome new factory building of its own at Canal Dover, O. The Skelley company has built up an enviable trade on telephone holders, concerning which we quote as follows from one of its recent folders:

"The Skelley telephone holder is best, cheapest and most convenient and will fit any size base. It will save time, money and a vast amount of annoyance. It is as much a necessity as the telephone itself and is as invaluable in the home as in the business office. It is so simple it cannot get out of order, and is so handy one cannot do without it. It is adjustable to any position and stays where put. The telephone is always where one wants it, when it is wanted; and when not wanted, it is out of the way. One does not have to move the telephone to open or close a desk, and the telephone cannot fall and break, as it is securely clamped in place.

"Where two telephone systems are in use, the double holder carrying both telephones is especially invaluable."

NEW MEN IN FARR COMPANY.

Messrs. Sam A. Dinsmore and George T. Lawton have bought an interest in the Farr Telephone & Construction Supply Company, at 118 W. Jackson boulevard, Chicago, and will give the affairs of this old established concern fresh impetus and capital. Sam Dinsmore was for over fourteen years in charge of the telephone department for the Electric Appliance Company, and is one of the best known men in the telephone field. He will be vice president and general manager under the new arrangement; Mr. Lawton will be secretary and A. D. Gibbs president. With these men at the helm the success of the company is assured.

S. A. Dinsmore.

MICHIGAN ASSOCIATION HANDBOOK.

A remarkably interesting and complete handbook has been compiled by W. S. Vivian, secretary of the Michigan Independent Telephone Association, and secretary-treasurer of the Michigan Independent Telephone Traffic Association, which contains a vast amount of valuable data regarding Independent companies in that state. The volume contains 104 pages and gives a condensed history of the Independent telephone movement in Michigan, a list of the companies in the state association and their officers, the constitution and by-laws, and a number of instructive papers read before the last Michigan convention. The book is well-arranged and furnishes a striking illustration of the scope and strength of the Independent telephone industry in that state. The Michigan association is to be commended for its enterprise in issuing such a useful book.

NATIONAL COMPANY REPORT.

The National Telephone Company, of Quebec, Canada, of which Dr. J. F. Demers, president of the Canadian Independent Telephone Association, is the moving spirit, has issued its annual report, which shows the company to be in a most flourishing condition. Following are the numbers of subscribers in new exchanges recently established by the company:

Lotbinière, 125; Lévis, 410; Dorchester, 104; Bellechasse, 60; Montmagny, 135; L'Islet, 87; Kamouraska, 29; Témiscouata, 488; Rimouski, 272; Matane, 280.

The National company has an authorized capital of $5,000,000 and a reserve fund of $120,000. The construction of Quebec will begin soon, making the most important step yet taken by the company.

The finance committee of the Windsor (Canada) city council has recommended to the city council that the city of Windsor become a member of the Canadian Independent Telephone Association, the city treasurer to be instructed to pay the subscription fee of $5. This means that another will be added to the rapidly growing list of towns that are desirous of breaking up the monopoly of the telephone lines of Ontario which is held by the Bell telephone trust.

NEW YORK STATE CONVENTION

Independent Telephone Men of the Empire State Transacted Important Business at the Annual Meeting Held Recently at Syracuse

By J. H. Oliver

THE New York State Independent Telephone Association will be officially represented at the annual convention of the International Independent Telephone Association to be held in Chicago next January. At the New York convention held at Syracuse, September 25, the state association voted to affiliate with the International Association, and authorized the president and secretary to sign the papers necessary to bring the New York organization into active relationship with the International body. The Independent telephone men of the Empire state held a very successful and instructive convention at Syracuse. More than 125 delegates were present when the association was called to order in the building of the Independent Telephone Company of Syracuse, representing nearly all the large companies of the state. In the absence of the mayor of the city, John Sadler, president of the common council, extended an official welcome on the part of the city government. George R. Fuller, of Rochester, made the response on behalf of the association. R. Max Eaton, secretary of the association, announced the death of Dr. William R. Campbell, the president. A. H. Cowie, the vice-president, who had been acting as president, was absent, and E. A. Aitken, of Auburn, was called to the chair. The association, by a unanimously adopted resolution, expressed its regret at the death of Dr. Campbell, who, during the portion of his term when he was alive, served the association faithfully and with ability.

R. Max Eaton.

The association appointed the following committees: Affiliation—Irving H. Griswold, Albany; George R. Fuller, Rochester; Wilbur H. Johnson, Buffalo. Nominations—John B. Pierce, Syracuse; George Otis, Newburgh; William Fluhrer, Auburn. State Organization—F. H. Potter, Rome; George B. Wright, Williamsport; J. T. Bellanger, Schenectady. Legislation—Judge Hendrickson, Albany; A. H. Cowie, Syracuse; B. G. Hubbell, Buffalo.

The committee on organization recommended that the membership in the association be changed from individuals to companies, and that for the perfection and maintenance of a complete organization the state be divided into districts, as is now being done in Ohio and several of the western states. The wording of the recommendation of this committee is as follows:

"Membership to the New York State Independent Telephone Association shall be accorded to individuals, corporations or companies, operating at least ten telephones, each one paying a minimum annual assessment of one dollar, and paying annual dues of one cent per operating telephone."

The state was divided into five districts, which are to be known as follows: The Buffalo district, Rochester district, Syracuse district, Albany district and Binghamton district. Officers appointed in these districts are: Buffalo—W. H. Johnson, chairman; B. L. Moore, secretary. Rochester—George R. Fuller, chairman; Mr. Beattie, secretary. Syracuse—John B. Pierce, chairman; C. H. Poole, secretary. Albany—I. H. Griswold, chairman; J. L. Bellanger, secretary. Binghamton—Mr. McDowell, chairman; George B. Wright, secretary.

The committee recommended that meetings shall be held in these districts in the months of October and April of each year, and that a standard form of report be forwarded by the district secretaries to the state secretary. There was considerable discussion on the report of the organization committee, but it was finally adopted and approved.

Mr. W. G. Thompson, of Hamilton, Ohio, representing the International Independent Telephone Association, spoke at some length on the complete organization of all states in the International association.

On motion the association voted to amend the by-laws so as to reduce the membership of the executive committee from twelve to six. The following officers and executive committee were then elected:

President, Irving H. Griswold, Albany; vice-president, Wilbur H. Johnson, Buffalo; secretary, R. Max Eaton, Niagara Falls; treasurer, George R. Fuller, Rochester.

Executive Committee—J. T. Bellanger, Schenectady; George B. Wright, Williamsport; I. H. Griswold, Albany; Wilbur H. Johnson, Buffalo, and C. H. Poole, Utica.

After the convention adjourned the Independent Telephone Company of Syracuse entertained the delegates at a clambake at Long Branch in the evening. The entertainment provided was excellent, and was heartily enjoyed by all. The New York convention this year accomplished more real work than at any previous meeting of the association, especially as the result of the proceedings will aid to complete the work of placing the organization upon a permanent and successful working basis. Sufficient revenue will be derived from the regularly provided assessments to give proper publicity to the development of Independent telephony throughout the state, and also lend a great deal of aid to the legislative committee in the gathering of information necessary in the performance of its duties.

It is expected the next convention will be held in New York city. At least this is the plan which meets with the approval of most of the Independent operators in the Empire state, as evidenced by those in attendance at the Syracuse convention.

TELEPHONE NEWS FROM ABROAD

Interesting Items Gathered from Foreign Countries for TELEPHONY'S *Readers*

By J. W. Bruer

THE International Bureau of Telegraph Administrations has issued its annual report as to telephone development in European countries, which forms an interesting study. Germany leads in the number of telephones in use, even surpassing Great Britain, while France ranks third. Sweden, considering its comparatively small population, makes a remarkably good showing. The number of telephone stations in each country is reported to be as follows:

Germany	584,105
Great Britain and Ireland	406,173
France	137,725
Sweden	130,895
Russia	66,940
Switzerland	55,039
Austria	53,051
Denmark	52,154
Norway	39,715
Holland	32,093
Italy	30,459
Hungary	28,122
Belgium	27,023
Spain	16,297
Roumania	4,410
Luxemburg	2,499
Servia	1,181
Bulgaria	870
Greece	840

The figures for Portugal are not given. Telephone development on the other side of the Balkans is very poor. Turkey at present has no telephones, but the establishment of exchanges in Constantinople and Salonica has recently been sanctioned by the ministry of trade. Germany and Great Britain are about equal in the proportion of telephones to population and are far ahead of the other great European states.

Concerning the situation in the German empire, which leads the above list, American consuls report that the telephone business there is under the control of three separate administrations—the Reichs-Postant, Berlin, being the controlling power for all of Germany, with the exception of Wurtemberg and Bavaria, where separate administrations control the telephone service. Until recently magneto switchboards and subscribers' apparatus have been in use in Germany. Within the last three or four years common battery switchboards and instruments have been introduced. Berlin is about to be transformed into a central battery system.

There is in Berlin one automatic switchboard, to which are connected ninety to a hundred subscribers. At the town of Hildesheim, in Germany, an automatic exchange for about two thousand subscribers will shortly be opened. In Bavaria subscribers' sets and switching apparatus are of the generator call type, with the exception of the towns of Ludwigshafen, Nuremberg, Fürth, Würzburg and Neustadt, where common battery service is given. In Wurtemberg all exchanges are still of the magneto type, some of them being with automatic clearing out, but not with transmitter battery supplied from the exchange. The make of apparatus used in Prussia is the government type, developed in its own workshop, and is manufactured by twelve different manufacturers in Berlin. In Wurtemberg the magneto subscribers' sets are manufactured in the government workshop, whereas receivers and transmitters of a standard type are bought in the open market.

In Bavaria the apparatus in use is of a government standard type and is made by manufacturers in Bavaria. Manufacturers from other parts of Germany have not been able to do any business there. At the end of 1905, the last date of reliable statistics, about 500,000 subscribers' stations were in use in the telephone service of the Reichs-Postant.

The number of telephones purchased annually amount in North Germany to about 50,000, in Wurtemberg to about 3,200 and in Bavaria to about 10,000. The service in the larger cities having individual exchanges on the common battery system is fairly satisfactory, and probably as satisfactory as it is in the larger cities of the United States. Berlin is at present undergoing a transformation, on the completion of which it is expected to give service which will be up to that given in New York. In Hamburg a new large exchange is being built, which will give fairly efficient service, at an immense cost, however. The service in Munich is very good, probably up to any given in the United States. In Stuttgart, Wurtemberg, the service is not up to what would be given in a city in the United States, the city having a single exchange.

Consul J. I. Brittain, of Kehl, states that the telephone instruments used there are manufactured by the government at Berlin. In the Grand Duchy of Baden and Alsace-Lorraine it is stated that there are about five thousand telephones in use, and about two hundred new instruments are supplied each year. The rent for the telephones is collected by the postoffice officials quarterly, in advance.

Consul Thomas H. Norton, of Chemnitz, reports that the telephone service, with 4,952 receivers in the city of Chemnitz, is the property of the city. Sixty-three neighboring towns are in close telephonic communication with Chemnitz, which employs an additional number of nearly five thousand telephones.

Consul W. L. Lowrie, of Weimar, sends a report stating that $238,000 is about to be spent in that German state for the improvement of the telephone service. Double wires will be strung and connections made with many points. The improvements were planned by the government on account of the increase in the use of the long-distance lines. There are now 2,855 telephones in use in the duchy.

The annual report of the British postoffice department, which runs the telephone system in England, contains the following regarding the telephone business in the British isles:

"The number of trunk wire centers open March 31, 1907, was 533, as compared with 487 on the corresponding date in 1906. During the year 288 new trunk circuits were provided, bringing the total number in use up to 2.043, containing about 73,000 miles of double wire. The capital expenditure on the purchase and development of the trunk wire system up to March 31 amounted to £3,376,252, including an expenditure during the past year of £478,749. The total number of conversations which took place over the trunk wires during the year 1906-7 was 19,803,300, showing an increase of 10.18 per cent upon the number for the pre-

vious year. The gross revenue derived from the trunk service was £480,658, against £449,004 in 1905-6, an increase of 7.05 per cent. The average value of each conversation was slightly less than in 1905-6, 5.82 pence instead of 5.97 pence. During the year postoffice telephone exchanges were opened in the provinces at 56 places, and 23 public call offices connected with the postoffice trunk line system were opened at places where the number of prospective subscribers was not sufficient to warrant the opening of exchanges. In the districts of Melton Mowbray, Chipping Norton, Malton, and Bourne, it has been possible to give a telephone service restricted to the local area by utilizing the wires erected for the transmission of telegrams—which are not numerous—between the central town and the postoffices of surrounding villages. The growing use made of such rural call office systems shows that the additional facilities thus afforded are appreciated. As stated in the last report, the postal reforms announced by the chancellor of the exchequer last year in the budget speech included the introduction of more liberal terms for the extension of the telephone system to outlying places under guarantee, whereas formerly the guarantors of telephone extensions were required to bear the whole of any loss incurred, two-thirds of it is now borne by the state. The telephone has thus been brought within the reach of many fruit-growing and agricultural districts, and it is hoped that some of the guaranteed call offices will in time develop into small exchanges.

"The total number of subscribers to the postoffice provincial telephone exchanges March 31, 1907 (excluding those at Glasgow and Brighton), was 10,010, as compared with 8,425 on March 31, 1906; and the number of telephones rented increased during the year from 10,380 to 12,006. The foregoing figures represent the normal growth of the postoffice provincial system due to the opening of exchanges in places hitherto without a telephone service, and to the accession of new subscribers to existing exchanges; but that system has during the past year received important additions through the purchase of the telephone undertakings of two municipal authorities. The Glasgow corporation system, which was worked by the corporation on behalf of the postmaster general from June 1 (the nominal date of purchase) up to September 10, 1906, included on March 31 last 11,103 subscribers' lines with 12,964 telephones. The system of the Brighton corporation, which passed under the control of the postoffice on October 22, included at the end of the financial year 1,542 subscribers' lines with 1,884 telephones. . . . The capital sums (£7,300,000 in all) voted by parliament under the telegraph acts of 1892-1904 for the extension of the telephone system are nearly exhausted, and an act has been passed in the present session to authorize the expenditure of a further sum of £6,000,000. This sum will, it is hoped, suffice for the development of the system until 1911. In that year, or possibly at an earlier date, it will be necessary to introduce legislation for providing funds and for other matters connected with the purchase of the system of the National Telephone Company" (the Bell concern).

James K. Logan, of Wellington, New Zealand, superintendent of the telegraph and telephone lines operated by the government of that country, and who has lately completed an extensive journey through Europe and America for the purpose of investigating telegraph and telephone conditions, had this to say regarding the working of the respective services in his own land, prior to sailing on his return to his home:

"We believe in government ownership of telegraph and telephone lines in New Zealand, but, of course, I could not answer for it in other countries where conditions are different. We never knew anything else there. Owing to the small population a private company could not afford to do what the government has done in the way of providing facilities for the smaller communities. Our population is less than a million and we have about 1,400 telegraph and telephone offices. Every one of these offices is a postoffice, but all postoffices do not give telegraph or telephone service.

"I believe New Zealand originated the plan of sending telegraph messages by telephone. It was in 1878, just after the telephone came into service, the postmaster general came to my district and told me that Seaton, a member of parliament, wanted a telegraph station located in a small hamlet in his district. He asked me if I could devise a way to accommodate him. I suggested that we might run a telephone wire into the hamlet and make it a telegraph station and transmit the messages by telephone. The idea struck the postmaster general as a good one and it was done. As far as I know this was the first instance of its kind.

"The telegraph and telephone are great features of our life. The government gives extended service to the remotest hamlets and provides the same service in these small hamlets, except that the messages are transmitted by telephone instead of telegraph. In addition to this service direct communication can always be had with the central towns. The result is that the great bulk of the telegraph offices are really telephone offices. In the remote districts the offices are placed in stores or in ranchmen's houses and the operators are paid by fees, so the cost to the government is mainly in the erection and maintenance of the lines, comparatively little being paid out in salaries. Exchanges are maintained in many of the smaller towns with connections for farmers' lines in all directions.

"The government charges flat rates for telephone service. In the six larger towns the charge is £7, or about $35 a year, for business telephones, and £5, or $25 a year, for private residences, with unlimited service in the exchange. In all other places the charge is £5 a year, including service up to midnight. In these smaller exchanges provision is made before the exchange closes so that physicians can be called at any time. The telephone service is self-supporting and the telegraph practically so."

Holding generous views as to the future growth of the city, the Vienna postoffice authorities have planned an enormous extension of the telephone system, so as to ultimately provide for 100,000 subscribers. There are now some 23,000 telephones in the city. Would-be subscribers have to wait months, and sometimes over a year, before their telephones are installed. This delay is largely due to the inadequacy of the main cable supply.

The new plans provide for these lines to be laid in all directions, and with an ample supply of connecting points in order to avoid tearing up the roadway whenever a new line is required. The number of exchanges will gradually be increased from the present two to nine, two of which will be in the center of the city, accommodating 15,000 subscribers each, while the other seven, for 10,000 telephones each, will be erected in the outside districts as occasion requires. The whole work will involve a tremendous expenditure, which, it is believed, however, will be fully justified by the saving in the future.

Consul General John P. Bray reports that the two leading cities of Australia, Melbourne and Sydney, are now connected by telephone, the line being officially declared open on July 10. The line is a little over 600 miles in length and is composed of two exceptionally strong and heavy copper wires; the cost of construction was $227,198, and it took four months to complete. The fee for conversations, $1.46 for three minutes, is thought to be too high in business circles, but the postmaster general, by whose department the line is controlled, has stated that if after three months' trial the line proves payable a series of progressive reductions in the rate will be made.

ITEMS FROM THE RURAL LINE DISTRICTS

Illustrated by O. H. Brandenburg

The telephone line was completed at Gackle.—*Douglas (N. D.) Herald.*

Dr. Rockefeller was in town last week, placing stock in his telephone line from Gunnison to Aspen.—*Aspen (Colo.) Times.*

A telephone line from the Russian settlement south of Galva was brought into town this week.—*McPherson (Kan.) Republican.*

It is reported that the Citizen Telephone will be put up Mill Brook in the near future.—*Thornton Letter Plymouth (N. H.) Record.*

The Stark Telephone Company is putting up new one-ring telephones from Maximo to Science Hill school house.—*Maximo Correspondence Alliance (O.) Review.*

The switchboard at Slowey's caught fire from lightning Monday night, but prompt work speedily extinguished the blaze.—*Dickens Correspondence Spencer (Ia.) News.*

The Fairmont Telephone Company moved their central station into Louis Nelson's place of business Friday and now Louie says "Hello!" just like a girl.—*Fairmont (Minn.) Sentinel.*

P. J. Skolsky, district manager of the telephone company at Eau Claire, was in Chetek yesterday consulting with Manager Speed and Prop. Ziesenis. He also took a swim in the lake.—*Chetek (Wis.) Alert.*

Jake Frantz was here from Sleepy Eye this week to connect the new telephone line with the local exchange, and Evan now has connection with a new territory in the country. The new line has sixteen subscribers.—*Evan Items Sleepy Eye (Minn.) Dispatch.*

Possum Trot camp, started and to be maintained by the Vermilion County Telephone Company for the benefit of its employes, is now in good condition and many of the employes have already spent several pleasant hours within its boundaries.—*Danville (Ill.) Press.*

There is a telephone rate war on at Butterfield, and while some of the residents of that village think they are being robbed by the telephone company, Bro. Eb. Huntington says they are not paying a dodgasted cent too much for the service they receive.—*Sanborn (Minn.) Sentinel.*

Manager Jas. Kirk of the Osakis Telephone Company spent Sunday at Long Prairie. His brother, Conductor Harry Kirk of Melrose, donned the spiked shoes and did a few stunts "hunting trouble" on the lines about town after the thunder storm Saturday night.—*Osakis (Minn.) Review.*

Miss Ollie Young, who became the bride to-day of Frederick Usury, was the twenty-fifth telephone operator at one of the two exchanges here to be married in four years. That the position is considered a talisman is attested by the fact that the manager was rushed this morning dismissing applicants.—*Pine Bluff (Ark.) Correspondence.*

AS I WAS SAYING; THE OUTLOOK IS VERY BRIGHT. MOST OF THE FARMERS ARE ENTHUSIASTIC - ETC
THATS GOOD MR. CONROW VERY GOOD
THEMS THE LONGEST LEGS BY GOSH THAT EVER STRUCK THIS TOWN
GROCERIES
HOW'S THAT FER A BEAN POLE
Brandenburg

Charles Conrow, the general manager of the Flushing Telephone Company, and who is six feet seven inches in height, being one of the tallest men in the country, was here yesterday seeing more parties about some right of way for his company. The Flushing company is one of the best conducted and paying Independent telephone lines in the state, and much of its success is due to Mr. Conrow's management.—*Bridgeport Briefs Wheeling (W. Va.) Intelligencer.*

With the telephone, rural delivery, furnace and bathroom within reach of practically all well-to-do people life on the farm is a different proposition from what it used to be years ago. The fat hogs and big steers furnish the bank account and willing workmen do the rest.—*Ironton (Ohio) Register.*

The rural telephone company owning the franchise at Springfield has been in a controversy with the recorder of that town over the rental of a telephone, the recorder insisting that he was entitled to the machine free in his residence. The company has finally agreed to give him what he wants, or reduce the rental $1 per month on his office 'phone.—*Redwood Falls (Minn.) Gazette.*

The operators at the Citizens' Telephone Company central gave a tin shower at the office last Saturday night for Miss Marie Johnston, one of their number, who has resigned—to get married, of course. Miss Johnston was generously "showered," and the affair was very enjoyable for all, even Manager Badour, who was permitted to partake of the refreshments.—*Allegan (Mich.) Press.*

The Big Sandy Telephone & Telegraph Co. has engaged space in this paper to let the people know the width and breadth of their splendid system. But as the copy was not forthcoming, we suppose Mr. Wilson is too busy putting his electric light plant in at the Hill, and extending his telephone lines to write up the copy. Don't tell him we are talking about him—We are friends now.—*Grayson (Ky.) Herald.*

Edwin Guy and Hubert Hainline of this city are engaged in repairing and restretching the wire on lines Nos. 1 and 2 of the Spring Creek Telephone Company. The work consists of not only stretching wire but straightening any pole that may be awry, retamping them in the ground if loose, cutting away any tree limbs or brush that may interfere, overhauling the phones and doing every other thing necessary to put the line in good order to run through the winter. Both the men named are well posted in the business, as they have installed a number of lines and know all about whether a line is in right condition or not. The line they are repairing stretches from Macomb to Sciota, swinging westerly through the Cole, Yard and Guy neighborhoods. The wires of Nos. 1 and 2 are on the same set of poles. The length of one wire is about 25 miles, or 50 miles in the two, and there are forty phones. No. 1 makes connection in town with the Western Illinois, or city telephone office; No. 2 at the Farmers' board on Jackson street, just west of the jail.—*Macomb (Ill.) Journal.*